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Official Publication of the State Medical Society of Wisconsin

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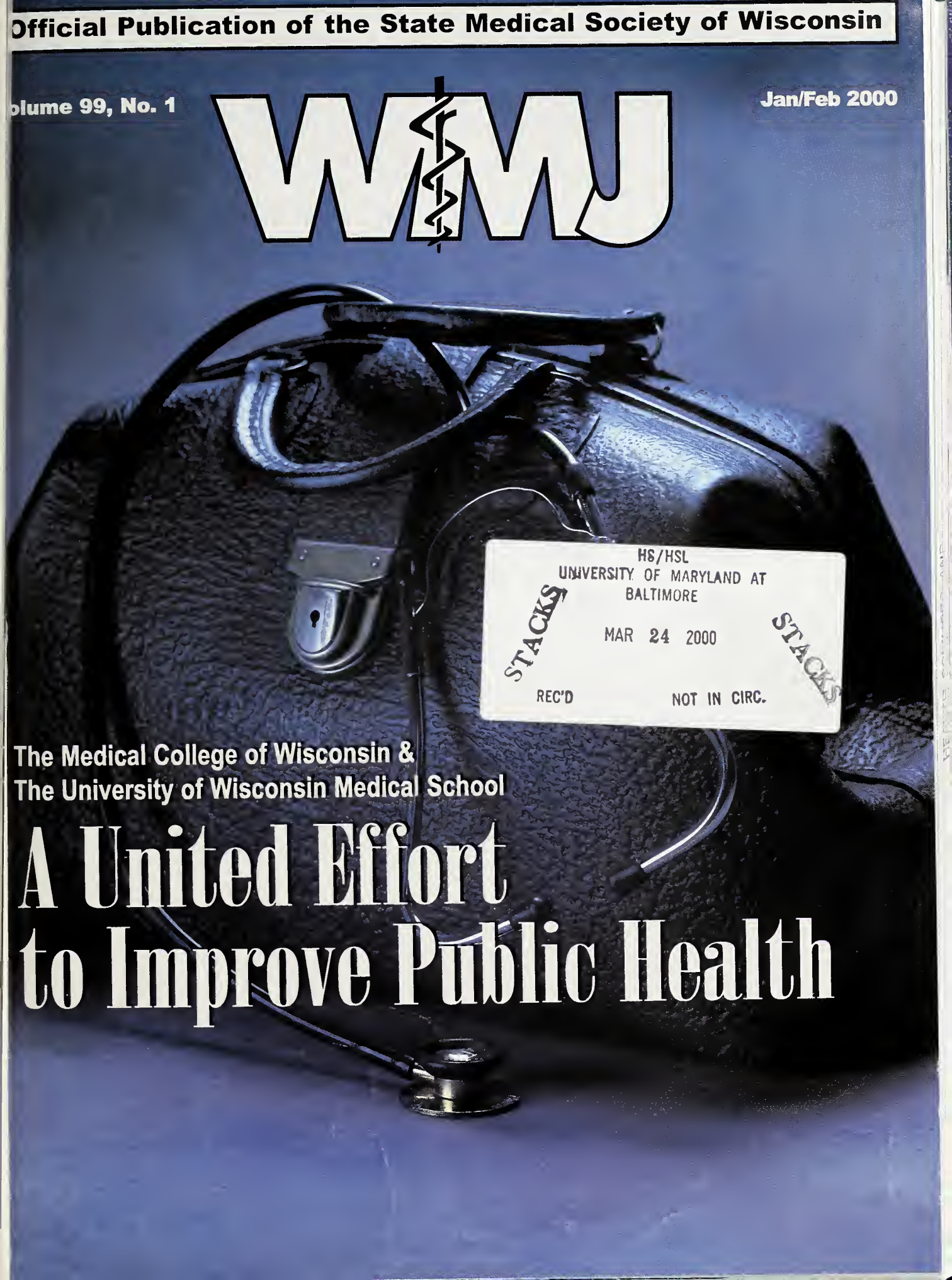
WMJ

Jan/Feb 2000



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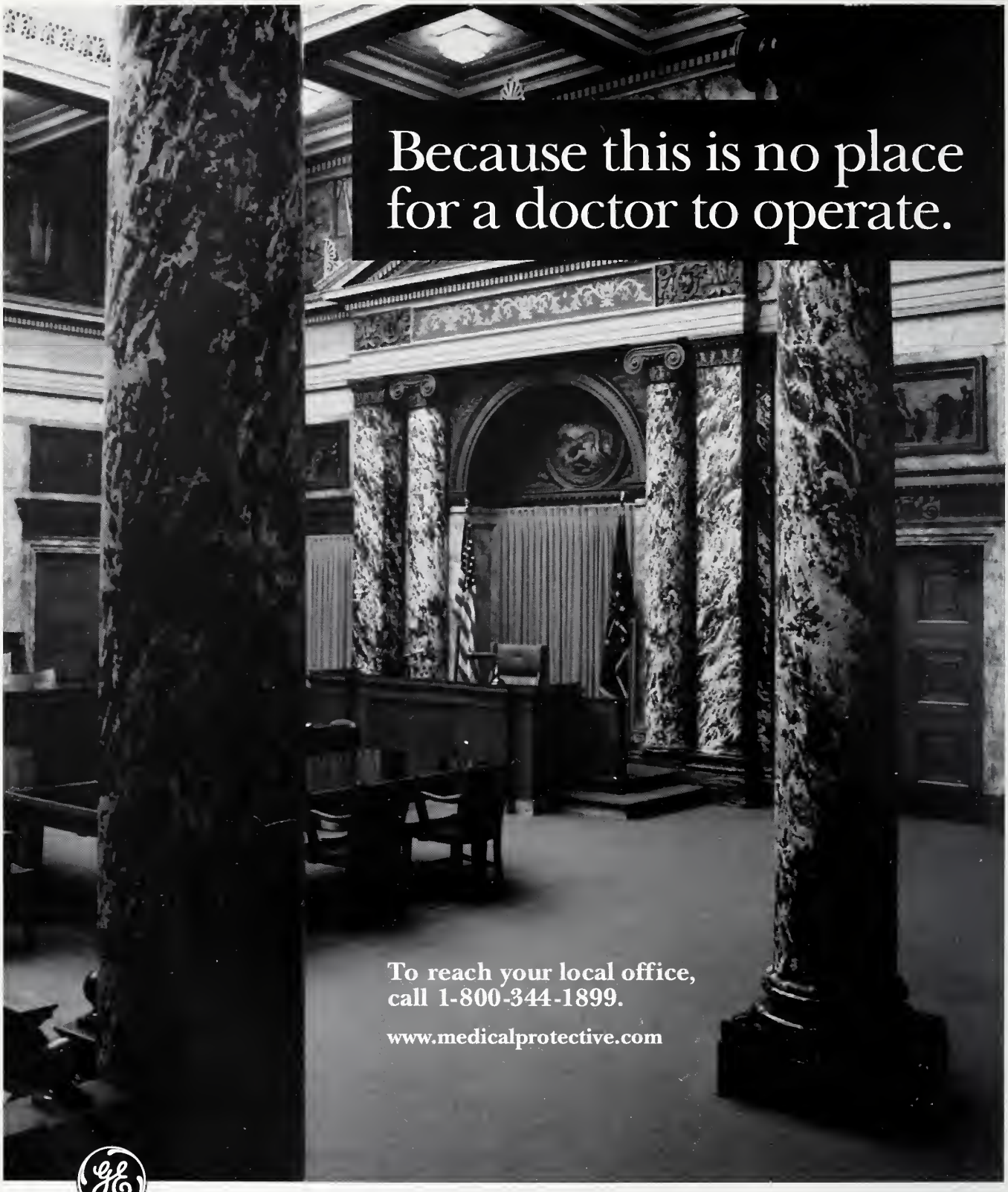
The Medical College of Wisconsin &
The University of Wisconsin Medical School

A United Effort to Improve Public Health



The Medical Protective Company®

Thomas C. Meyer, MD

Editorial

The Reason We Do What We Do

by Thomas C. Meyer, MD, WMJ *Medical Editor*

A number of unrelated events have led to changes in the structure and content of *WMJ* that may be apparent to anyone who regularly peruses each issue. Let me recount the events in chronological order.

Last March George Lundberg was in Madison for several days shortly after being relieved of his editorship of *JAMA*. Kendi Parvin and I attended one of Dr. Lundberg's lectures and asked that he critique several recent issues of *WMJ*. When we met with him a few days later, Dr. Lundberg made several incisive remarks, three of which stand out. He was most critical of two omissions. First, that *WMJ* should have its mission published in every issue. Second, that we had omitted - in all four issues we gave him - any reference to instructions to authors. He upbraided us for this - as one of the cardinal sins of publication! Our heads hung, and maybe he felt sorry for us when he added that he believed we were doing a good job of what he saw as a difficult task: combining the mix of scientific papers and socio-economic issues important to SMS members. Hence, the *WMJ* mission, as developed by the Editorial Board and approved by the Board of Directors, appears for the first time (p 2) in this issue and we shall print it regularly. We have printed instructions to authors or references to them since last summer.

The medical schools expressed concern about the 1999 *WMJ* budget cuts and offered to provide funding for an additional issue this year. We reciprocated by inviting the schools to submit more papers. A short time later, the Blue Cross/Blue Shield proposal concerning the $250 million endowment to the two schools to "advance the health of Wisconsin's population" galvanised the schools into action and initiated a far-reaching exploration of the perceived public health needs of the citizens of Wisconsin. Thus, it seemed appropriate that this effort and the subsequent findings should be reported in the issue of *WMJ* supported by the schools. We are pleased to present an eclectic mix of descriptive, quasi-scientific and scientific papers.

This issue begins, appropriately, with a joint editorial by Deans Dunn and Farrell (p 11), followed by a description of the process used to assess Wisconsin's perceived health needs. This contains an interesting summary of the problems and proposed preventive strategies. A more detailed account of the telephone strategy includes a brief summary of the proposals from the two schools on the use of the BC/BS endowment.

The three "Occasional Papers" are an interesting group. Doctors Kindig and Farrell explore the problems and pitfalls of the process decided upon by the medical schools and point out that the $250 million invested doesn't generate all that amount of ongoing interest (p 25). Doctor Remington (p 27) issues an impassioned plea for - public health to be modelled along the lines suggested by the Institute of Medicine 12 years ago, which suggested that public health get out of the business of direct patient care and use its resources for assessment, policy development and assurance while the private sector take the responsibility of patient care. And Dr. Foldy (p 29) imagines what it would be like if medicine and public health really cooperated.

The papers reviewed by the Editorial Board are included in the "Scientific section" of this issue. Doctor Libby and colleagues take us back to public health in medical schools but with a much more lucid explanation of population health and how it affects Wisconsin than this reader remembers (p 34). Doctor Eaker documents the process and preliminary findings of the Marshfield Rural Womens Health Study (p 37). Doctor Kelly explores behavior change and disease prevention (p 41) by detailing the experience at the MCW Center for AIDS Intervention and Research. Doctor Willis outlines the development of school-linked health centers in Milwaukee and their service to the under-privileged and under-insured (p 44). Doctor Withers and colleagues present an interesting public health approach to firearms injuries (p 48) emphasizing the role of communities in dealing with this and other vexing problems. Finally, Ms McCusker and colleagues discuss Wisconsin's Native American mortality rate and possible underlying factors for discrepencies between that and the rate for all races (p 50).

So we start this new year with much to do and report on, but also with the hope that we will continue to meet your interests and needs.

WMJ

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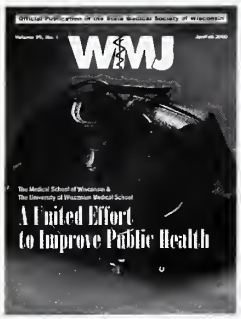

COVER THEME
WISCONSIN'S HEALTH

Advancing the health of Wisconsin's population. The Medical College of Wisconsin and The University of Wisconsin Medical School have programs in place striving to attain that goal. But when Blue Cross & Blue Shield United of Wisconsin announced its intention to establish a public health foundation with proceeds going to the medical schools, the possibilities amplified. In this issue of WMJ, *the medical schools report on some existing efforts as well as future plans to improve the health of Wisconsin's citizens.*

Cover design by Kendi Parvin, *WMJ* Managing Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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Edwin Downing, MD

Physician Citizen of the Year

Eye Doctor's Vision Helps Poor See, Live Better

by Steve Busalacchi, Director, News & Information

SMS member Edwin Downing, MD, is an Oshkosh ophthalmologist who sees a need and then acts to satisfy it.

Since 1987, Dr. Downing has made seven international medical mission trips to cities in Zaire, Romania and Kenya, one of which was during his honeymoon.

"If she could handle that, I figured she could handle the rest of it," a chuckling Downing says of his wife, Lois, a nurse practitioner who works with him at their private practice office.

"He is a kind, caring doctor who extends his expertise not only in Wisconsin, but also to the less fortunate in third world countries," writes Physician Citizen of the Year nominator Lynne Webster, from the Oshkosh Chamber of Commerce.

Doctor Downing collects medical supplies and equipment to send to these countries and then helps train the local health professionals on how to use them during his vacations.

"Twenty million people in the world need simple cataract extraction to escape complete blindness, not just the little glare we work on here," says Dr. Downing, in explaining what drives him. His wife's experience as an 11-year old in Congo also strongly influenced his passion for mission work. She was unable to walk for six months, until a missionary doctor from America diagnosed her problem.

RICH IN SPIRIT

"He didn't make a lot of money, but he sure made a lot of difference," Dr. Downing says of that missionary physician, whom he'd later come to know. Downing himself has known missionaries all of his life.

Growing up in Kenya, the child of missionary parents, Downing learned early on about how many people lack basic needs. Even his grandfather was a missionary in Kenya in 1901. "I guess it's in the blood, the genes," Dr. Downing says.

Downing especially cherishes his trips to Romania, where he trained a local ophthalmologist to use implants and a laser.

"That was exciting for me to be the only connection he had with this kind of technology and to be able to help him become a practitioner," Downing says. "That's a whole lot more reasonable than for me to try to make a visit to a country and do a few surgeries and leave."

NEVER 'BOARD'

In addition to his missionary work in foreign countries, Dr. Downing has accompanied volunteers, led by his wife, to Appalachia to build homes for the poor. He estimates having helped build five or six houses.

"My dad didn't teach me how to play golf, but he did teach me how to cut a board," he says.

Having also served as Chair of the United Way Health Committee, Director of the Rotary Club and President of the Chamber of Commerce, Dr. Downing is well known in Oshkosh.

"There is no praise too high for this 'gentle man' in every sense of the word. Oshkosh and Wisconsin can be very proud of his service to mankind," wrote Webster in her nomination letter.

Doctor Downing received the 1999 SMS Physician Citizen of the Year Award during a ceremony on September 27, 1999, in Oshkosh. The honor recognizes physicians who volunteer their time and talents to help others in the community and world.

"While he's an excellent example for the medical community, Dr. Downing is also a role model for young people," said SMS President-Elect Ayaz Samadani, MD, during the awards ceremony.

Doctor Downing isn't sure if there are any more medical missions in his future, but he plans to stay active with the missionary board.

In his spare time, he also plans to continue tinkering with his 1928 Model A, which he takes for a spin at least once a year. It may seem an unlikely connection, but Downing's practice of maintaining the antique car himself reminds him of mission work.

"In Africa, *you* do it or it doesn't get done."

Welcome New Members

The individuals listed below were recently elected to SMS membership by their county medical societies. We are pleased to welcome them to the SMS.

Ashland-Bayfield-Iron
Donald G. Patton, MD

Brown
Robert B. Ballard, MD
Martin J. Landa, MD

Chippewa
Christine M. Murphy, MD

Dane
Carolyn M. Blanc, MD
Athena Daniolos, MD
Marquerite Elliott, DO
Michael P. Ford, MD
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Timoteo L. Galvez, MD
Diane E. Head, MD
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Terrie A. Mailhot, MD
Antoninette M. Peters (S)
Marina I. Polianska, MD
Lester T. Proctor, III, MD
George M. Saviello, MD

Who's in the News

Russell Gonnering, MD, an ophthalmologist practicing at St. Luke's Medical Center, Milwaukee, has received the Merrill Reeh Pathology Award from the American Society of Ophthalmic Plastic and Reconstructive Surgery.

Two SMS members were recently honored for their membership in the American Academy of Family Physicians: **John S. Honish, MD,** 30 years; **Eric R. Lyerla, MD,** 15 years. Doctor Honish is a physician with Prevea Clinic in Green Bay; Dr. Lyerla is a physician with Dean Medical Center in Madison.

George Korkos, MD, of Elm Grove, was recently honored in a recognition program at the Medical College of Wisconsin's 18th annual Walter Zeit Fellowship recognition dinner.

Robert J. Schultz, MD
Devinder Kaur Sidhu, MD
Richard L. Wolman, MD

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Grant
Ramesh Babu Vemuri, MD

Green
J. C. Penhos, MD

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Brian M. Sieck, MD

Manitowoc
Michal Chiu, MD
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Robert G. Teehan, MD
Tresa Ann Teehan, MD

Marathon
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Nicole Ann Leow, MD

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John S. Broderick (S)
Thomas L. Carter (S)
Brian Tsiwah Chan Kai (S)
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Lee Allison Engelbreth (S)
Edward H. Evans (S)
Moshe Feldhandler (S)
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Cha Lee, MD
Sarah J. Lena (S)
Alex Shingyu Leung (S)
Lubna Majeed, MD
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Mary Ann M. Mathias (S)
Sarah A. McClintock (S)
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(S) designates medical student membership

AMA Awards

The SMS member physicians listed below recently earned the AMA's Physician Recognition Award. They have distinguished themselves and their profession by their commitment to continuing education, and the SMS offers them its congratulations.

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Kenneth Adler, MD

Eau Claire Physician Founds/ Runs Free Clinic

The Chippewa Valley Free Clinic in Eau Claire has handled more than 3,000 patient visits since it opened in 1997. It's a community success story, thanks to a team of volunteers, and the leadership of **SMS member Kenneth Adler, MD**, 1999 SMS Physician Citizen of the Year.

"An undertaking such as this does not happen unless someone has the vision to bring people and resources together and to keep the enterprise focused on its goals," writes Sandra Dirks, RN, who serves on the clinic's board of directors. "In this case, that someone was Dr. Ken Adler."

Dirks nominated Adler, the free clinic's volunteer medical director, for Physician Citizen of the Year, which honors physicians for their uncompensated service to the community.

Peace Corps influence

Doctor Adler's volunteer service began long before he proposed a free clinic for Eau Claire. As a child, his first jobs were volunteer ones at a hospital and at a youth association for mentally disabled citizens. But it wasn't until 1979 when he entered the Peace Corps to teach high school science in Sierra Leone, West Africa, that he learned what volunteer work was all about.

"That was probably the biggest motivator for me to go to medical school," recalls Dr. Adler, a family practice physician. "I saw my neighbors get very preventable illnesses. My students were killed by snakebites. The girl who lived next door to me died of measles."

Adler's concern back then for his neighbors would come as no surprise to his patients today.

"(Dr. Adler) went down to the clinic when it wasn't open, just to meet me because my asthma was pretty bad," says Dawn Bouchard, 37, a patient who lacks health insurance. "He went right down to meet me when he didn't have to." Bouchard says she has the medicine and devices that help her breathe thanks to Dr. Adler and the free clinic.

Making it happen

Establishing the clinic was no walk in the park. It took two years to overcome many challenges, which included the formation of a board of directors, finding a donated building and then raising $50,000 to turn it into a clinic.

"Each of these hurdles seemed absolutely insurmountable, but everybody rose to the occasion," says Dr. Adler.

"(Dr. Adler) has been the keystone, in terms of managing to get people together, and getting us focused on the task of getting a free clinic in place," recalls Dirks. She says his easy manner and sense of humor helped motivate everybody toward accomplishing the goal.

For example, Dirks remembers how well Dr. Adler endured razzing by the volunteers because he had always hand wrote the agenda items for their initial meetings rather than use a computer. When the doctor entered the PC age, he printed the agenda in a different font each month to show his friends and colleagues how technically adept he was becoming.

Keeping pace

A self-described "workaholic," Doctor Adler puts in at least two days per week at the free clinic. That's in addition to his practice at Group Health Cooperative of Eau Claire.

At the Chippewa Valley Free Clinic, Adler not only sees patients and negotiates referrals, but he continually recruits colleagues to help cover the two nights per week that the clinic is open. Despite his busy schedule, Dr. Adler says there's a special satisfaction with providing this service.

"Working with people who don't have insurance is really gratifying as a doctor," he says, noting that the clinic serves many young people with first jobs that either don't provide health insurance or offer insufficient coverage.

The need is great enough, according to Bouchard, that there are usually people waiting at the door before the clinic opens and patients still receiving care two hours after its scheduled closing time.

Bouchard is breathing easier, thanks to Dr. Adler's help. And she says lots of others are too.

"(The free clinic) was a really good idea. I think it helped a lot of people."

Physician Citizen of the Year

No Health Insurance, No Problem

by Steve Busalacchi, Director, News & Information

In Remembrance

Ancheta, Valentino S., MD, 68, of Algoma, passed away October 22, 1999. He earned his medical degree from the University of Santo Tomas of the Philippines and came to the United States in 1959 where he interned at St. Anthony de Padua Hospital in Chicago. He completed his residency in general practice at Capitol Hill Hospital in Washington, DC, and three years of general surgery training at Norwegian American Hospital in Chicago.

In 1970 Dr. Ancheta moved to Algoma and joined the Algoma Clinic. A year later he opened his solo practice. In 1982 he received his certification from the American Board of Family Practice. He was a fellow of the American College of Medicine and the American Academy of Family Practice. He served as president and secretary/treasurer of the Door-Kewaunee County Medical Society.

Doctor Ancheta is survived by his wife, Mary Ann; five children, Marie (Mike) Meyers, of Crystal Lake, IL, Dawne, of Oak Park, IL; Jennifer, of Minneapolis, MN; Michael (Shelley), of Oak Park, IL; and Robert, of Madison; five grandchildren, Marissa, Ali, Katie, Nicole and Mathew.

Curry, James T., MD, 77, of Monroe, passed away December 1, 1999. He served in the US Air Force and fought in the Pacific arena during World War II before earning his medical degree from the University of Illinois College of Medicine in 1956. He served his general medicine internship at Milwaukee County Hospital, and surgical residency at St. Francis Hospital in Evanston, IL. After completion of his surgery residency, he practiced at St. Clare Hospital, Monroe for nearly 30 years.

Doctor Curry was a Fellow of the American College of Surgeons, member of the Veterans of Foreign Wars, and served as team physician for a number of years at Aquin High School.

Doctor Curry is survived by his children, Michael (Liane), Patrick (Cynthia), Jane (Gino) Amodeo, John (Suzanne), Cathy (John) Witherow, Mary (Reinhardt) Awender, James (Deborah), Timothy (Holly), Margaret (Brian) Geiseman, Daniel (Jennifer), 20 grandchildren and two great-grandchildren.

Elbe, Ted D., MD, 90, of Thiensville, passed away December 28, 1999. He earned his medical degree from Marquette University and completed his internship and residency at St. Joseph's in Milwaukee.

In 1937, Dr. Elbe started a solo practice in Port Washington before transferring to Thiensville in 1939. He was a Zeit Fellow, a Double Paul Harris Fellow, and a member of the 1987 SMS 50 Year Club, amongst many other accolades.

Doctor Elbe is survived by his children, Dan (Jeanne), Kay (Jerry) Lackey, Mari (Moose), Chip (Jane); grandchildren, Jeff, Mari Kay, Ted, Lisa, Chris, Laura, Danie Watt, Bill Watt, Niki and Megan; and 17 great-grandchildren.

Hein, William E., MD, 72, of Monroe, passed away December 11, 1999. He served in the US Navy for two years before going on to earn his medical degree from the University of Wisconsin and completing his internship at St. Mary's Hospital in Duluth, MN.

Doctor Hein practiced medicine in Brodhead from 1955 until 1967 when he started a one-man department of general practice at the Monroe Clinic. He practiced there until 1975, and from 1976 to 1979 he was the Medical Coordinator of the Emergency Department of St. Mary's Hospital Medical Center in Green Bay. After moving back to Monroe in 1983, he founded the Monroe Clinic Immediate Care Department at St. Clare Hospital. He worked at this walk-in clinic until 1989, then continued his work at various Monroe Clinic locations until retiring in 1992.

Doctor Hein was a co-founder and member of the Madison Medical Advisory Committee, assistant professor at the UW-Madison Medical School in 1971, past president of Wisconsin Academy of Family Physicians, vice president of the American Trauma Society-Wisconsin Chapter, past president of the University of Wisconsin Medical Alumni Association and various other organizations and associations.

Doctor Hein is survived by his wife, Audrey; five children, Maggie (Jayme) Johnson, of Little Falls, MN; Nick (Sue), of Renton, WA; Matt, of Prescott AR; Frank (Terri Bassett), of Seattle, WA; John (Patti), of Germantown, WI; and seven grandchildren.

Hovis, Jr., William F., MD, 85, of Milwaukee, passed away December 22, 1999. He received his medical degree from Northwestern University Medical School in Evanston, IL. He opened his medical practice in Milwaukee after serving as chief surgeon in an amphibious force in the Pacific during World War II.

Doctor Hovis was a clinical professor at the Medical College of Wisconsin, a co-founder and past president of the Milwaukee Gynecological Society and founding member of the American College of Obstetrics and Gynecology. He was a founder of the female pelvic cancer and tumor board at Milwaukee County General Hospital, on the staff of County General, Columbia and Good Samaritan Hospitals, and a member of the 1990 SMS 50 Year Club.

Doctor Hovis is survived by his children, Paul, of Los Angeles, Peter, of Fox Point, William, of San Francisco, and Susan Lawson, of Springfield, OR.

Mitcham, Leroy, MD, 79, of Milwaukee, passed away October 1, 1999. He was a sergeant in an aviation unit in the South Pacific during World War II and returned to receive his medical degree at Meharry Medical College in Nashville, TN. He was one of the first black pediatricians to join the staff of Milwaukee Children's Hospital. He retired from his medical practice in 1982. In 1983 Children's Hospital gave him an award for distinguished service.

Doctor Mitcham is survived by his wife Tabitha; his children, Eric, of Milwaukee, Valeria Mitcham-Cooper, of Vacaville, CA and Rosalyn Arefian, of Fairfield, CA.

Owens, Andrew J., MD, 82, of Elm Grove, passed away December 8, 1999. He earned his medical degree from Ohio State University School of Medicine and interned at Gorgas Hospital in the Panama Canal Zone, specializing in ophthalmology. He completed a residency at Detroit's Grace Hospital.

Doctor Owens served in the military from 1942 to 1946 as a captain in the Medical Corps in Panama. A majority of his practice was at St. Michael's and St. Mary's Hospitals. He was a Fellow in the American Academy of Ophthalmology and Otolaryngology, member of the medical staff and chief of the surgical department (1962-1963) at St. Michael's Hospital and on their executive committee, Diplomate of the American Board of Ophthalmology, life member of the Milwaukee County Medical Society and the State Medical Society of Wisconsin.

Doctor Owens is survived by his sons, James and Anthony (Christine), and his grandchildren, Jessica, Jayne, Jordan and Kelsey, and a brother, Francis J. (Lois).

Stueland, Dean T., MD, 49, of Hewitt, passed away January 7, 2000. He earned his medical degree from the University of Wisconsin in 1977 and completed his internship and residency at Marshfield Clinic and St. Joseph's Hospital. In 1997 he received his Masters in Public Health from the Medical College of Wisconsin.

Doctor Stueland practiced at the Marshfield Clinic since joining the Marshfield Clinic Internal Medicine Residency Program in1977. He served as medical director of the National Farm Medicine Center, the AODA Unit/Marshfield Alcohol and Drug Treatment Program, the Occupational Medicine/Industrial Medicine Program and the Weyerhaeuser Corporation. In addition, he was the medical director for the Pittsville Ambulance Service, as well as the co-founding medical director of the Spirit of Marshfield Transportation System, Assistant Clinical Professor of the University of Wisconsin Clinical Faculty, a fellow of the American College of Emergency Physicians, of the American College of Physicians, and of the American College of Preventive Medicine. He was one of two physicians appointed by the Governor to the initial EMS Advisory Board and served on many local, county, state and national committees and boards.

Doctor Stueland is survived by his wife, Marlene; his children, Jeffrey, Michael, Nancy and Kevin.

WMJ

Call for Papers, Reviews, Commentary

In 2000, *WMJ* will examine issues related to public health in Wisconsin. The *WMJ* Editorial Board is seeking original manuscripts related to these themes:

Chronic Disease (to be printed in June)
Deadline for peer review papers: March 15
Deadline for other submissions: April 1

Infectious Disease (to be printed in August)
Deadline for peer review papers: May 15
Deadline for other submissions: June 1

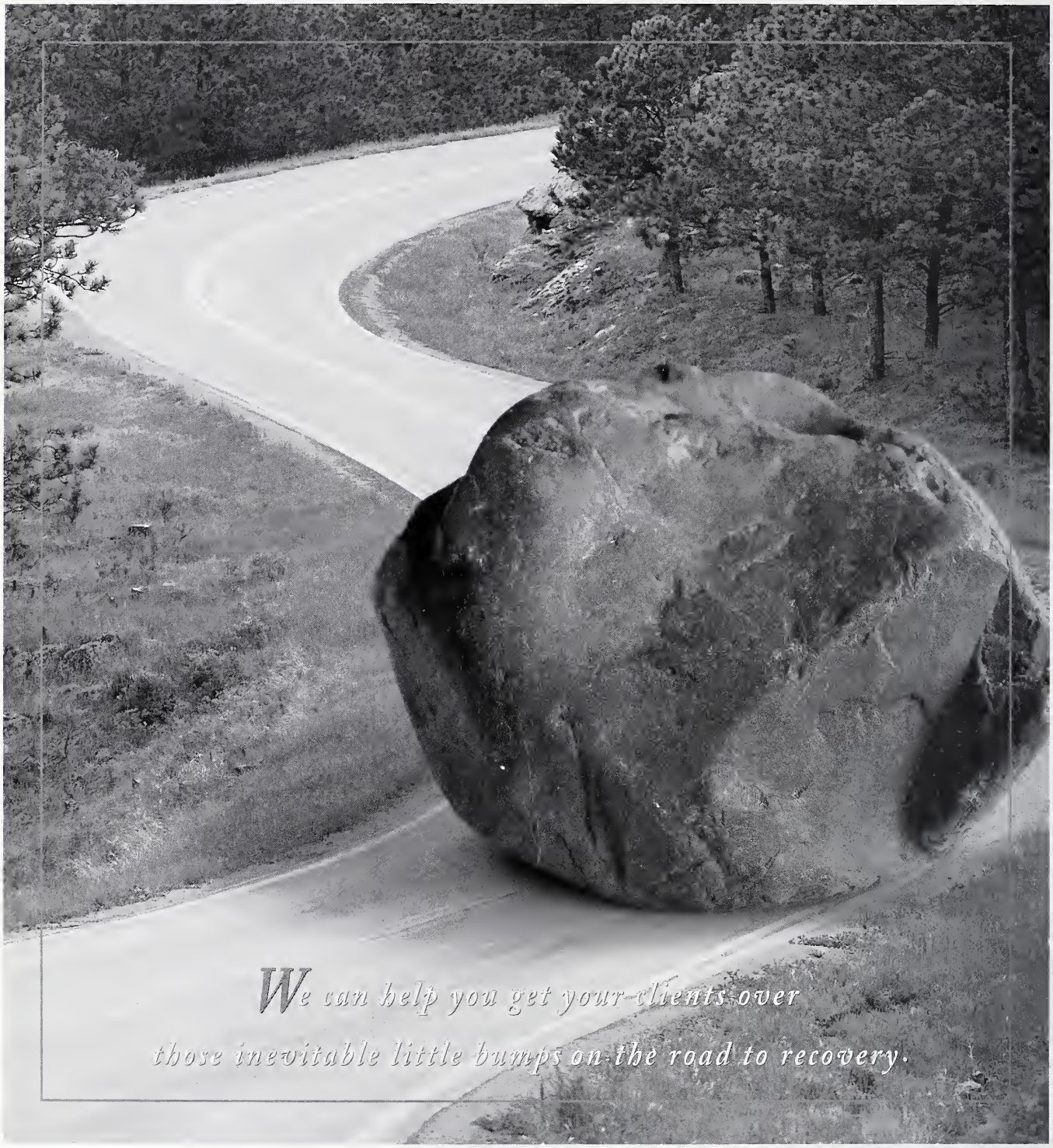
End-of-Life Issues (to be printed in September)
Deadline for peer review papers: July 15
Deadline for other submissions: August 1

Geriatric Health (to be printed in October)
Deadline for peer review papers: August 15
Deadline for other submissions: September 1

Environmental Health (to be printed in November)
Deadline for peer review papers: September 15
Deadline for other submissions: October 1

Injury Prevention (to be printed in December)
Deadline for peer review papers: October 15
Deadline for other submissions: November 1

In addition, general scientific papers are always appreciated and will be published on a regular basis. All submissions should conform to *WMJ* requirements. For further information contact Kendi Parvin, Managing Editor at 608.257.6781, toll-free at 800.362.9080, or via e-mail at: kendip@smswi.org. Instructions to authors are available on the SMS website at www.wismed.com.



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Michael J. Dunn, MD

Philip M. Farrell, MD, PhD

Guest Editorial

Medical Schools Spearhead Assessment of Wisconsin's Health Needs

by Michael J. Dunn, MD, and Philip M. Farrell, MD, PhD

At this auspicious time in history —as we've just entered the new millennium—the state of Wisconsin is poised on the cusp of a breakthrough in academic programs addressing public health needs. An extraordinary gift from Blue Cross & Blue Shield United of Wisconsin, which will be endowed and preserved in perpetuity, has the potential to profoundly influence the health of all citizens of the state for years to come.

This has occurred because on June 3, 1999, Blue Cross & Blue Shield's board of directors announced its intention to convert to a for-profit corporation and establish a foundation dedicated to improving the public's health with the proceeds from that conversion. To be administered through the state's two medical schools—the Medical College of Wisconsin and the University of Wisconsin Medical School—the endowment, titled "Advancing the Health of Wisconsin's Population," is expected to total $250 million.

Blue Cross & Blue Shield requested that the schools spearhead an exhaustive information-gathering process to carefully assess current and future health needs. The process involved extensive opportunities for public comment, thorough analysis of existing data, and a random-sample survey of the population. With input in hand, we developed a plan we believe to be both responsive and responsible, reflecting widely held opinions and hard statistics on reasonable, realistic ways to significantly advance the health of people residing in every corner of the state. Blue Cross & Blue Shield is reviewing the plan, which in broad terms recommends the following:

- increased emphasis on the prevention of the most prevalent diseases through research, education and statewide outreach activities;
- expanded biomedical research into the major causes of death and disability in Wisconsin, particularly cardiovascular disease, cancer and stroke;
- strengthened linkages with state and local organizations to improve the health of underserved populations, such as women living on farms, Native Americans on reservations and economically disadvantaged people in inner cities;
- extended collaborative translational research that hastens the application of discoveries from the laboratory into clinical practice;
- enhanced educational opportunities for practitioners interested in learning more about community and public health, including new graduate-level degree offerings and additional continuing education programs;
- augmented population and community health research to further clarify health care needs of the state, with the general areas of women's and children's health, cancer, cardiovascular disease and aging; and—upgraded communication systems—teleconferencing, informatics, distance education, and websites—to better disseminate information and clinical findings.

In addition to allowing us to meticulously evaluate Wisconsin's health needs, the process we have gone through to determine the best ways to allocate the most effective means to improve the state's health has had further benefits. It has laid the foundation for greater enhanced collaboration between the two medical schools and created an important synergism between medicine and public health. The synergy represents a potential new paradigm in health care, an integration of traditionally unaligned disciplines. Our two medical schools—with shared strengths in population health, epidemiology and health policy, as well as diagnosis and treatment of disease—will facilitate development of the emerging health care model of the future, which undoubtedly will serve to optimize the health status of all Wisconsinites.

Our schools have worked cooperatively to create this plan, and will continue to do so as the process unfolds. Medical schools are the logical stewards of this lasting legacy, this unprecedented opportunity to assure a healthy future for Wisconsin.

Doctor Dunn is Dean of the Medical College of Wisconsin. Doctor Farrell is Dean of the University of Wisconsin Medical School.

Assessing Health Concerns and Priorities: Process and Results

Following the announcement of Blue Cross & Blue Shield United of Wisconsin's plans to create a new public health foundation, Wisconsin's two medical schools organized a comprehensive assessment of the health status and needs of the state's diverse population. Noting that the first plan draft was due by the end of July, the schools undertook an extensive effort to identify current priorities that could potentially be addressed by medical school initiatives. The three components of the assessment are summarized below.

A. Multiple Opportunities for Public Comment
Listening sessions (public hearings) were held at nine sites, both urban and rural locations throughout Wisconsin. These sessions were well attended by more than 500 people, with approximately 200 individuals providing oral testimony on health concerns and priorities. President T. Michael Bolger, JD, of the Medical College of Wisconsin and Dean Philip Farrell of the UW Medical School were present at all sessions to hear these "Wisconsin voices." More than 500 additional comments were received from individuals via e-mail, a toll free phone number and US mail.

B. Random Sample Survey of Wisconsin's Population
The schools contracted with the St. Norbert College Survey Center to conduct a random survey on public perceptions of the state's health care needs and priorities and recommendations for use of the Blue Cross & Blue Shield funds. This random survey of 451 Wisconsin adults, aged 18 and older, allowed the medical schools to ascertain the opinions of a representative cross-section of Wisconsin citizens who might otherwise not respond to their request for comments. *(See companion article, page 15.)*

C. Analysis of Existing Data on Health Status and Needs
Considerable federal, state and local health care data are available and were gathered and reviewed. This information complements the more subjective data gathered through the first two approaches and adds the regional perspective systematically. In addition, the schools also reviewed the progress of the Department of Health and Family Service's *Turning Point* initiative. One outcome of *Turning Point* will be a model for setting statewide health and systems priorities. When this model becomes available at the end of the year, it should prove to be a continuing resource for identifying future health needs.

Assessment of Wisconsin's Health Needs & Priorities

July 6 - August 3,1999

Listening Sessions
(Public Hearings)
- July 6, 1999
  Stevens Point, DePere
- July 9, 1999
  Woodruff, Superior
- July 14, 1999
  Janesville/Beloit, Madison
- July 15, 1999
  Milwaukee
- July 16, 1999
  La Crosse, Menomonie

Toll Free Phone Number
(voice mail)
E-Mail
US Mail

Additional Sources of Public Comment
- Briefing for Legislators (July 7, 1999)
- Meeting with Great Lakes Intertribal Council (July 19, 1999)
- Wisconsin Public Radio Call-In Show (July 19, 1999)
- Random Survey of 451 Wisconsin Residents (July 17–29, 1999)
- Analysis of Existing Data and Reports:
  - Mortality and Morbidity Data
  - Community Needs Assessments
  - Population Health Check-Up
- Recommendations from MCW and UW Faculty

Reprinted with permission from *Advancing the Health of Wisconsin's Population Through Excellence in Medical Education, Research and Community Service.*

A Healthy Life Span for Wisconsin Citizens
Summary of Health Problems and Preventive Strategies

Age Group	Leading Health Issues	Prevention Strategies
Infants <1 year	Congenital anomalies, SIDS, low birth weight	Prenatal care; healthy mothers
Children, ages 1-14	Injuries, primarily motor vehicle crashes; child abuse and neglect	Immunization and well child care, developing lifelong healthy habits
Adolescents/young children, ages 15-24	Motor vehicle crashes, homicide, suicide, tobacco and alcohol use, sexual behavior	Developing lifelong healthy habits
Adults, ages 25-64	Cancer, heart disease, diabetes, depression	Screening and disease management, providing accurate health information
Older Adults, ages 65+	Heart disease and stroke, cancer, disability and social isolation, depression	Screening and disease management, rehabilitation, quality long-term care, palliative care
All ages	Premature deaths and disability; health disparities by income, education, or race	Health promotion and education; policies to promote safe products, environments, and lifestyles; access to low-cost, high quality health care

Citizens' Concerns About Health Priorities

The assessment completed in July 1999 provided the schools with a greatly enhanced understanding of the long-term challenges associated with "advancing a healthier Wisconsin." In their comments, Wisconsin citizens identified a variety of health-related issues. Although Wisconsin has a relatively healthy population, the state clearly has many health needs which citizens feel are not being fully addressed.

A number of health-related themes were repeated, although there appeared to be no public consensus regarding top priorities. Specific diseases/population health needs were mentioned most frequently, although the areas of concern varied. Women's health issues were frequently identified, along with cancer, cardiovascular disease, mental health (excluding AODA), aging issues (Alzheimer's disease), Diabetes Mellitus, and infant and childhood diseases.

Support for research to eradicate disease and the promotion of expanded community-based clinical research trials were strongly advocated. There was also strong interest in prevention and wellness activities, including behavior modification and fitness and nutrition programs.

Concern was expressed over the financing of public health initiatives and the need to help communities meet identified public health needs.

A number of individuals also commented on the difficulties of accessing care, both for uninsured and underserved individuals, and those living in urban and rural underserved communities. Expanded support for the education and training of health professionals was urged, along with the building of collaborative relationships between K-12 school systems, colleges and universities and community health providers.

Health care needs and concerns vary by age, gender, race and ethnicity, and place of residence. Examples of leading health problems by age and prevention strategies appear in the chart a)bove.

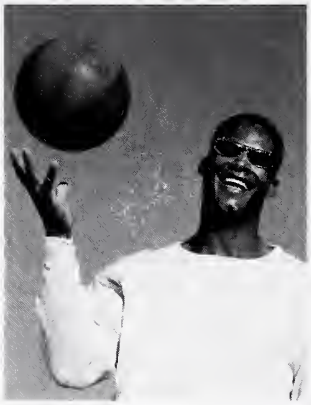
In addition, several process issues were identified by the public. A number of comments expressed a desire for the schools to preserve the principal by creating an endowment. The importance of collaborating with communities and existing organizations working on health care issues was also stressed.

During this public process, concerns regarding the overall Blue Cross & Blue Shield United of Wisconsin conversion process were expressed.

• • •

This assessment process highlighted the variety and complexity of health-related concerns within Wisconsin. This diversity necessitates a balanced approach toward improved health, requiring a focus not only on today's health needs but also on the needs of future generations. While all of these issues are not addressable within the scope of the plans developed by the schools, the information does provide a unique opportunity for all of us involved in shaping the future of health care to understand what health related issues are of most concern to our citizens.

You don't pay tax on a Roth IRA



This is the big attraction of a Roth IRA—you don't pay tax when you make a qualified withdrawal, not even on the earnings and gains that build up.

You must follow certain rules, such as holding the Roth IRA for at least 5 years and reaching the age of 59½.

What's more, you can convert many traditional IRA accounts to a Roth IRA. And you can contribute to a Roth IRA after the age of 70½.

You will need to meet the guidelines, and make careful comparisons to determine which choice is best for you.

Other IRA options also offer tax advantages. For example, you can withdraw up to $10,000 from most IRA accounts without paying an early-withdrawal tax, if you use the funds to buy a first home or pay for higher education.

For all the facts on Roth and other IRA benefits, see your 1999 tax booklet. Or check the IRS Web site: **www.irs.gov**

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Build Homes

Phone Poll Gets at the Heart of Citizen Concerns About Modern Health Care

If the decision were left to the citizens of Wisconsin, the $250 million gift the UW Medical School and Medical College of Wisconsin will receive from the newly created Blue Cross & Blue Shield United of Wisconsin Public Health Foundation would be spent largely on researching a cure for cancer. That's just one of the intriguing results revealed by a statewide health concerns phone survey conducted in July by the St. Norbert College Survey Center. The survey was one of several assessment tools used to develop *Advancing the Health of Wisconsin's Population,* the plan that will guide the use of the Blue Cross & Blue Shield funds by the state's two medical schools.

Thirty-one percent of the 451 Wisconsin residents surveyed identified cancer as the medical challenge most in need of research and treatment dollars. Interestingly, cancer also topped the list of citizen health concerns—75 percent said they were either very or somewhat concerned about the topic. Other significant health issues mentioned included heart disease (including hypertension and heart attacks), strokes and other neurological disorders, and infectious diseases. Not surprisingly, many of the responses to questions about specific health issues appeared to reflect the age- and gender-specific concerns of those surveyed; for instance, women's health and aging issues (Alzheimer's disease, osteoporosis) were cited by more than 80 percent as very or somewhat concerning. At the same time, issues of more universal concern, such as illness prevention through nutrition and fitness and the quality and accessibility of health care also resonated with many. In the case of the former, 90 percent agreed that illness prevention should hover near the top of any health-care checklist.

Respondents were also asked to identify the issue they believed to be the most important in preventing illness, and the answers they gave represent encouraging news for the Medical School and Medical College. The majority (65 percent) identified training physicians and health care providers, while research and education also made strong showings.

The survey was conducted between July 16 and July 29, 1999. Respondents were selected among all adults 18 years old or older within each household, using a random selection technique to ensure that all adults would have an equal chance of being interviewed. The demographic profile of respondents reveals that 40 percent were rural, 33 percent suburban and 25 percent urban. Income and age category respondents were representative of the general population.

"This survey was an important element in our assessment," noted Philip M. Farrell, MD, PhD, dean, UW Medical School.

Most public comment was offered by those within the health care system or who clearly had a special, though sometimes personal, interest, according to T. Michael Bolger, JD, president, Medical College of Wisconsin. "Without the survey, the voice of the general public could well have been overlooked."

Statewide Health Concerns Survey Results

Major Health Concerns	% Very/ Somewhat Concerned
Prevention of Illness	90%
Women's Health	89%
Quality of Health Care	86%
Aging Issues such as Alzheimer's Disease	84%
Accessibility of Health Care	80%
Trauma	78%
Orthopedic/Rheumatologic Disorders	76%
Cancer	75%
Environmental Factors	73%
Prenatal Care	73%
Respiratory Conditions	66%

Importance to Prevention of Illness	% Very Important
Training Physicians	82%
Research	80%
Education of Public	78%
Recommendations for Schools' Use of Blue Cross Funds	
Cancer	32%
Health Education	13%
AIDS	3%
Alzheimer's Disease	3%
Health Insurance	3%
Heart Problems	3%

Editor's Note: Opinions expressed in this article are those of the University of Wisconsin Medical School faculty.

Medical Schools Develop Plans to Address Public Health Needs

On June 3, 1999, Blue Cross & Blue Shield United of Wisconsin announced its intention to convert to a for-profit corporation. A key provision of the Blue Cross conversion stipulated the establishment of a foundation dedicated to improving the public health of Wisconsin's citizens. The UW Medical School (UW) and the Medical College of Wisconsin (MCW) were selected as recipients of the Foundation's proceeds, an estimated total of $250 million.

As a condition of the gift, the two schools were charged with assessing the public health needs of the entire state and developing plans that address those needs. *(See companion articles, pages 12 and 15.)* In less than three months, a remarkably short time-frame to prepare proposals of this magnitude, the assessments were completed and the plans ready for submittal to the Office of the Commissioner of Insurance (OCI), as a part of the conversion plan. The OCI will review all segments of the Blue Cross & Blue Shield proposal and hold public hearings. A final ruling may be some way off, but the schools are moving ahead to prepare for the funds.

"We believe, with our administrative infrastructure, our traditional role in educating health professionals and our strong track record of translational research, the two schools are uniquely qualified to administer these funds," said T. Michael Bolger, JD, president, Medical College of Wisconsin

The assessment, particularly the public sessions, was very important in establishing the plan priorities according to Philip M. Farrell, MD, PhD, dean, University of Wisconsin Medical School.

"Our sessions around the state brought us face-to-face with the diverse needs of our population," he said. "It is clear we have many health care advantages here in Wisconsin but there are also many unmet needs."

In response to public comment, both schools propose to invest the bulk of their funds as endowments, using the proceeds to fund the initiatives in their plans. The plans are complementary, with each addressing aspects of the most critical needs identified by the assessment process. For both schools, this will be the largest single gift ever received.

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MEDICAL COLLEGE OF WISCONSIN

The Medical College of Wisconsin proposes to extend its missions of education, research, patient care and community service to create a healthier Wisconsin with its share of the $250 million Blue Cross & Blue Shield United of Wisconsin Public Health Foundation dollars. MCW will use up to $15 million of the initial disbursement from the Foundation to launch new programs immediately and to expand the existing programs identified in the plan.

Plan components include the following points.

I. MCW Institute for Public and Community Health

(35-45% of endowment income)

Through the creation of the new MCW Institute for Public and Community Health, MCW will provide professional expertise, coordination of community programs, and enhanced visibility for issues related to improving the health status of citizens throughout Wisconsin. MCW proposes to provide a core of infrastructure support to address health concerns of various communities, support prevention and wellness programs, and facilitate diverse areas of health services research, while partnering with various health care organizations, especially in underserved urban and rural communities throughout the state.

The Institute will have a statewide focus, and Institute support staff will facilitate and coordinate

collaborative program initiatives with communities and organizations throughout Wisconsin. It will be led by a director, who will report to the MCW's dean and executive vice president. The director will oversee the budget and operational activities of the Institute. An advisory board of community leaders will be formed. It will consist of 8 to 12 members, with an interest in public and community health, selected by the MCW Board of Trustees. The advisory board, in consultation with Institute staff, will develop and evaluate strategic priorities for the Institute and serve as advocates for, and generally oversee, the Institute's programs.

The Institute's strategic priorities will guide the development of new Institute programs and community collaborations. A framework for building effective community partnerships will be a key component of the new Institute's development. A commitment to an agreed-upon set of principles is a critical first step for long-term success of a partnership. Using these principles as a guide, a partnership agreement which clearly identifies the roles and responsibilities of each partner, along with well-defined outcomes and mutual benefits is developed. Each member of the partnership will provide resources to support health improvement strategies. This can occur through the provision of expertise, manpower, facilities or funding.

Prevention/Wellness
Prevention and wellness initiatives are a key component in achieving significant improvements in health status. The diseases that represent the leading causes of death in adults (i.e. cardiovascular disease, cancer, stroke) all have modifiable risk factors. It is estimated that 30 percent of cancer deaths are due to tobacco use, while dietary factors account for about another 35 percent of all cancers. Lifestyle modifications alone could provide dramatic health improvements, if successfully maintained.

The Institute will support a broad spectrum of community prevention/wellness initiatives throughout the state, along with behavior modification research to develop effective lifestyle modification programs. Specific emphasis will be given to prevention and wellness programs in *cancer, cardiovascular disease, child & adolescent health, and women's health*. Special consideration will be given to the needs of underserved urban and rural communities. These initiatives will be developed in collaboration with community partners within the framework of the Institute's strategic directions.

Health Issues
The Institute will strengthen existing community partnerships and forge new community collaborations to help address these and other emerging health care concerns. Community/academic partnerships can effectively address these health concerns by bringing to bear the skills and knowledge of both partners. While academic institutions have expertise in health prevention and maintenance, community-based organizations are familiar with the strengths, needs and culture of their communities. Working together as partners, we can successfully assess community concerns, and develop and implement appropriate intervention strategies.

Examples of existing MCW community health initiatives include the Center for Healthy Communities and the Center for the Advancement of Urban Children. The Institute would potentially support expansion of these initiatives along with new programs developed in cooperation with community organizations throughout Wisconsin.

Health Services Research
The Institute will work with organizations and agencies throughout Wisconsin to identify areas of health services research which are needed to effectively plan for the state's future health needs. These academic/community partnerships are essential to the successful identification of community needs and the support, development and implementation of joint programs to address these concerns.

We believe that focused investment by MCW in the Institute will help to leverage additional funding opportunities and successes for diverse groups and programs to improve the health status of Wisconsin citizens. The Institute's advisory board will share responsibility with MCW leadership to evaluate and shape the Institute's programs.

Those programs which have a local, Milwaukee-area focus will be coordinated with the UW Medical School's newly established Center for Urban Population Health, to be located in Milwaukee. Initial areas of collaboration include prevention and wellness programs to address concerns related to women's health (e.g. osteoporosis, cancer screening, domestic violence, etc.) and improvement in child and adolescent health (e.g. prenatal care, immunizations, lead poisoning prevention, etc.).

II. Research for a Healthier Tomorrow
(35-45% of endowment income)
MCW will support research into the prevention and possible cures of the major causes of death and disability among Wisconsin citizens. Funding to expand access to clinical research trials for a broader segment of the state's population

will also be provided. By expanding this clinical research access, MCW will be able to speed the translation of research findings into community practice norms.

Cardiovascular diseases and cancer are the leading causes of death for Wisconsin citizens. Approximately two-thirds of all deaths in the state are attributable to these two diseases. Stroke, a neurodegenerative disorder, is the third leading cause of death in Wisconsin, with frequent debilitating consequences for its survivors. During the past 20 years, considerable progress has been made in the treatment and prevention of these diseases. However, grim statistics indicate that much remains to be done to reduce the devastating impact these diseases have on the lives of Wisconsin citizens.

MCW and the UW Medical School will continue to pursue a complementary approach to biomedical research into the leading causes of death in Wisconsin, emphasizing the strengths of both organizations. For example, MCW's approach to cardiovascular disease, cancer, and neurodegenerative diseases, such as stroke and Alzheimer's disease, will include an emphasis on the genetic understanding of these afflictions. MCW's strengths lies in the assessment of complex genetic disorders and gene function. UW Medical School's strengths in this area of emphasis are in statistical genetics and genetic models. Both schools also have active collaborations regarding the genetics of various diseases with the Marshfield Clinic, whose strength lie in the detailed analysis of gene sequences. This pluralistic approach towards research into the major causes of death and disability in the state utilizes the strengths and capabilities of a variety of institutions to further our joint goal of improving the health of the public.

The Medical College of Wisconsin proposes to extend its missions of education, research, patient care and community service to create a healthier Wisconsin with its share of the Blue Cross & Blue Shield dollars.

Cardiovascular Diseases

There are approximately 191,000 individuals currently living in Wisconsin who have cardiovascular disease. It is the number one cause of death in the state, with more than 19,000 people dying every year. Cardiovascular disease and heart attacks occur more in men than women, though heart attacks are more likely to be fatal for women. There is also a greater prevalence of high blood pressure and heart attacks among African Americans. Despite advances in detection and treatment of cardiovascular disease, it remains the leading cause of death nationwide.

Researchers at MCW and the UW Medical School have made important contributions to recent advances in understanding the pathophysiology of diseases of the heart and vasculature. While each group has achieved excellence in its own right, together they are among the foremost groups of cardiovascular investigators in the nation. This leadership in cardiovascular research is evident at the national level and has had some statewide impact, where despite being the leading cause of death, Wisconsin's cardiovascular death rate is lower than the national average.

The focus of the research varies between the two organizations. For example, MCW faculty are nationally recognized leaders in hypertension research, while UW Medical School scientists have concentrated on heart failure mechanisms and blood vessel disorders. Funding for cardiovascular research will support a variety of initiatives, including expanded research collaborations between MCW and the UW Medical School.

Research funding support will be coordinated between the two institutions to avoid any potential duplication. MCW's research efforts will include hypertension and coronary artery disease, as well as a specific emphasis on the genetic basis for cardiovascular disease, especially hypertension. Hypertension within the African American population as well as the increasing incidence of heart disease among women will also be studied.

Cancer

Cancer is most prevalent in the southeastern section of the state. In the most recent data available (1999), southeastern Wisconsin has a cancer mortality rate of 173/100,000 population, compared to a state average of 159/100,000. Milwaukee County has the highest cancer death rate/population of any county in Wisconsin.

Today, more people are surviving cancer than ever before. However, there are still problems and concerns amidst this good news. As the population increases and ages, the absolute number of cancer cases expands. Continued growth in the number of cancer survivors and their longer survival times will result in an increase of cancer morbidity as a major public health problem.

MCW's research efforts will focus not only on detection, treatment and cures, but will also include a specific emphasis on the

genetic basis for cancer. Many areas of cancer will be investigated including breast, prostate, colon, lung, gynecologic, and leukemia/lymphoma. Cancer prevalence in Wisconsin will be studied as well as higher incidence rates for women, and African American populations.

Neuroscience

Neuroscience research investigates diseases of the brain through diverse techniques including genetic models of degenerative disease, brain mapping, and the biology of brain cells. Neuroscience research progress will help to alleviate the long-term cost and reduced quality of life from Alzheimer's disease, Parkinson's disease, epilepsy, and stroke. Wisconsin continues to exceed the national death rates for Alzheimer's disease, while stroke is the third leading cause of death in the state.

Research related to these various neurodegenerative disorders will be coordinated with the UW Medical School. For example, in 1985, MCW formed a comprehensive Dementia Research Center. In 1998 the UW Medical School established the Wisconsin Alzheimer's Institute. The Dementia Research Center and the Wisconsin Alzheimer's Institute, with the Helen Bader Foundation, are already collaborating on dementia research and the establishment of statewide programs including the development of diagnostic centers, mechanisms of family support, and educational materials. The programs of both organizations have differing areas of emphasis. Whereas the Wisconsin Alzheimer's Institute is focused on rural and statewide concerns, the Dementia Research Center targets urban and minority needs.

In addition to providing progress in the detection and treatment of diseases such as Alzheimer's, Parkinson's, epilepsy and stroke, neuroscience research may also provide insight into a variety of mental health disorders such as schizophrenia and manic-depressive disease. Research will also provide keys to the brain's response to various substances, thus facilitating advancements in treatment programs for addiction.

Clinical Research Collaborations

Research funding will also be used to support expanded geographic access to clinical research trials around the state and to promote research collaborations with other health care providers, voluntary health care organizations, and research institutions. By broadening clinical research partnerships and expanding patient access to new treatment protocols, we will enhance opportunities to find cures for life-shortening diseases.

III. Educational Outreach
(10-20% of endowment)

The education of health profes-

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sionals, like the practice of medicine, is a constantly changing, dynamic process. New programs are offered, while others are revised to respond to the ever-changing challenges in health care. The population's health status directly relates to the education of our health professional workforce and the knowledge level of the general public regarding healthy lifestyles.

satellite technology to provide conferences and discussions of both personal and public health issues. These jointly offered conferences and health information repositories will allow for contributions from the faculty of both schools and will increase the number of offerings available to the public. In addition, MCW will, in the year 2000, join

The University of Wisconsin Medical School has proposed using up to $20 million of the proceeds from its share of the Blue Cross & Blue Shield funds for initial expenditures to catalyze the development of prevention-oriented programs and infrastructure.

MCW is first and foremost an educational institution. We not only train health professionals and scientists, but also provide continuing education programs and educational opportunities for patients and the public.

Educational Outreach
MCW currently offers computerized access to medical library holdings, medical literature searches, health resources (HealthLink), distance learning opportunities for physicians, and continuing medical education programs for health professionals throughout the state. These offerings will be expanded, new distance learning initiatives for health care professionals implemented, and teleconferencing program opportunities will be provided.

MCW will work with the UW Medical School to establish a collaborative, statewide health information network that will encompass both personal and public health issues. Network development may include both electronic information through means such as websites and video/

UW-Madison, UW-Milwaukee and WiscNet in a coalition interfacing with an upgraded electronic information highway, known as "Internet2."

Additional health care training programs in rural and medically underserved areas would also be supported by MCW through this educational outreach initiative in collaboration with community providers and health care organizations. This would include expanding medical student externships and rotations in rural and medically underserved areas of Wisconsin, as well as expanding residency rotations at these sites. MCW will also investigate the potential of expanding or establishing new residency training sites in collaboration with community health care partners to meet the needs of the underserved areas of the state.

Masters of Public Health
The citizens of Wisconsin expressed a desire for expanded educational opportunities for individuals involved in public and community health. MCW's existing Master of Public Health (MPH) program offers degrees in Health Services Administration, Occupational Medicine, and Preventive Medicine to individuals with a medical degree. MCW is currently expanding the program to non-physicians.

The curriculum development and accreditation process for the program expansion will take approximately two years. Following all required approvals, MCW anticipates entering its first non-MD MPH students in the fall of 2001.

Student Scholarships
To support students with an interest in health sciences professions, 10 full medical scholarships will be made available to qualified medical students. These student scholarships will have a special emphasis on minority and rural students. The scholarships will include a requirement to practice for a minimum of three years in a medically underserved urban or rural location of the state upon completion of residency training and medical licensure. Placements for these students to fulfill their scholarship obligation would be sought in collaboration with community organizations in underserved locations of Wisconsin.

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL

The UW Medical School has proposed using up to $20 million of the proceeds from its share of the $250 million Blue Cross & Blue Shield funds for initial expenditures to catalyze the development of prevention-oriented programs and infrastructure. The remainder of the funds will be used as a permanent endowment to be established at the University of Wisconsin Foundation.

The programs will include the following points.

I. The Enhancing Community and Rural Health Fund
(5-10% of endowment income)
This component will be available to support innovative projects conducted in partnership with UW Madison faculty and staff that address targeted health needs in rural and urban communities. This support will be distributed through an annual competitive process and will require matching funds. Awards will be in increments of $50,000.

II. Serving the Underserved Populations of Wisconsin
(10-20% of endowment income)
These dollars will be used to enhance programs and initiatives that address the needs of underserved urban and rural populations, including the sovereign Indian Nations.

Rural Health
The UW Medical School is proposing an integrated strategy for enhancement of its rural and community health programs to help address these gaps. An Assistant Dean for Rural and Community Health will be recruited during the 1999-2000 academic year to provide program leadership and foster innovation and a Rural and Community Health Advisory Council will be established. In addition, the school's strategic plan will be strengthened by incorporating an expanded rural component with goals and objectives developed in collaboration with communities.

A rural training track option for third and fourth year medical students will be developed with the Wisconsin Area Health Education Center and our affiliated regional campuses. The UW Medical School, through its Department of Family Medicine, working with the Wisconsin AHEC System, will add rural training track options at all of its Family Medicine Residency training sites.

Urban Health
The UW Medical School plans to develop a Center for Urban Population Health, based on its Milwaukee Clinical Campus, with links to other urban sites serving the uninsured and underinsured, such as the existing South Madison Clinic and a new clinic in Beloit. This Center will address unique urban health and community medicine issues, with an initial emphasis on the health needs of key population groups – women, children, the aged, and minorities. Outcomes research on Wisconsin's urban, underserved populations, including evaluations of the optimal manner in which to deliver health care in underserved communities will be emphasized. The Center will coordinate with MCW's new institute, the Milwaukee Area Health Education Center, the University of Wisconsin-Milwaukee, Aurora Health Care, Milwaukee Health Department,

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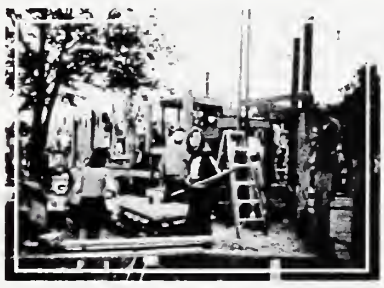

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community clinics and other community-based organizations. A new assistant dean based in Milwaukee will provide program leadership for the Center for Urban Health and foster innovative approaches to addressing urban health problems.

The Center for Urban Population Health's mission, to improve urban health through partnerships that address the medical and non-medical contributors to individual and community health, will be accomplished through the following four essential activities: research, training, evaluation and planning, and prevention and community education.

III. Disease Prevention Through Research
(40 - 60% of endowment income)
In response to the great public interest, the obvious needs and the major opportunities, the UW Medical School will use funds from Blue Cross & Blue Shield to increase its emphasis on disease prevention. History has demonstrated that the health status of Wisconsin citizens will improve as a result of new knowledge and a variety of behavioral changes. In the 21st Century, prevention will be achieved through a balanced mix of research, education, interventions and lifestyle changes. This new paradigm will build on a growing body of knowledge on human genomics and information technology.

Priority areas for an enhanced emphasis on prevention include women's health, cancer, cardiovascular diseases, and aging and neurodegenerative diseases (e.g., stroke, Alzheimer's disease and Parkinson's disease). Our current intent is to provide each priority area with 10 to 15 percent of the income on the endowment with these funds to be divided between program (80 percent) and infrastructure (20 percent) costs. Our other strategic priority–population and community health–will also be strengthened by a combination of educational program development and a greater emphasis on community-based epidemiology research.

IV. Further Development of Public Health Academic Programs
(20 - 30% of endowment income)
Public health education, both training professionals and informing the public, will be a major component of our efforts. The Blue Cross & Blue Shield gift will provide critically needed programmatic and infrastructure support and the information gathered last summer has identified needs and avenues to sharpen and guide the following population and community health sciences initiatives.

Education. Comments at the public hearings and other aspects of our assessment identified expansion of the School's population health-related teaching programs as a critically important area. Our response to this need is based on a long background in this area and a network of important associations.

- *Addition of a Public Health Track in Population Health*
  We will begin to recruit students specifically interested in public health careers. Our current MS and PhD training program will be expanded to include formal experience in public health agencies, most particularly the State Laboratory of Hygiene and the Wisconsin Department of Health and Family Services, as well as exposure to other public and private health agencies. The thesis or dissertation research required to complete the MS or PhD degrees respectively will be conducted within public health agencies.

- *Assessment of Other Public Health Workforce Need*
  In consultation with our adjunct faculty and other colleagues in the Division of Public Health we will complete an assessment of the other disciplines and personnel needed in the public health sector and the means to address these needs. This will include an examination of the desirability of a MPH degree program and accreditation from the Council on Education for Public Health.

- *Continuing Education for Public Health Professionals*
  At public listening sessions, mid-career public health professionals expressed strong dissatisfaction with the need to travel to other states for continuing education. Using existing expertise within the Department of Preventive Medicine and new resources in distance education programmed for the Health Sciences Learning Center, we will establish a summer leadership institute for public health professionals.

- *Training of Physicians in Population and Community Health*
  For many years clinically prepared physicians interested in epidemiology received graduate training in Preventive Medicine. With federal training grant funds secured by the Department of Family Medicine, primary care physicians (family physicians, internists and pediatricians) are now studying for the MS in Population Health. This experience, part of their specialty training, includes a research experience in their clinical disciplines focused on the assessment of community health needs, investigating disease causation and evaluating prevention program effectiveness. The Blue Cross & Blue Shield funds will support expansion of this program.

  We also plan to expand training to include a preventive medicine fellowship track in

cooperation with our statewide, nationally-recognized Family Medicine residency. This program's focus will be twofold – to prepare physicians not only to work in public health agencies, but also to provide practicing clinicians with the skills to investigate, analyze and respond to the health needs of their community.

Research. An extensive, population-based research program exists, with a fiscal year 2000 total of $8 million in training and research funds, including $7 million from the National Institutes of Health. A number of long-term epidemiological studies investigating problems important to the public's health are underway in populations throughout the state.

In health services research, major areas of focus include (a) development of methods to accurately measure the health status of populations, (b) assessment of the cost/effectiveness of health care interventions for prevention and early detection of disease, and (c) investigation of the effect of the health delivery systems on the cost and quality of health care. In addition, the Department of Family Medicine is a national leader in gaining federal support for community- based research emphasizing cardiovascular disease prevention, prevention of alcohol and substance abuse and cancer prevention in clinical practice.

Resources from the Blue Cross & Blue Shield endowment will provide needed flexibility to initiate studies in new, less explored areas of population health research such as women's health. These seed funds will enable researchers to develop the primary data necessary to compete successfully for sustained funding at the national level.

Outreach. The Blue Cross & Blue Shield endowment will assist the UW Medical School in strengthening its relationships with agencies' services:

- *Public Health Agencies*
  The close association of the UW Medical School with the Wisconsin Department of Health and Family Services and State Laboratory of Hygiene has been noted. Recently a plan has been implemented to strengthen the Preventive Medicine faculty presence in the State Laboratory through joint hires of faculty to replace recent retirements among the laboratory's leadership. The fund will help increase both training and research opportunities in the state's public health laboratory.
- *Wisconsin Network for Health Policy Research*
  This organization was established by the School to encourage

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and disseminate health services and policy research at the UW-Madison and throughout the state. The network has established an electronic listserve of more than 300 Wisconsin researchers and policymakers and holds a Wisconsin Health Policy Research Conference every other year. It has produced policy papers in response to requests from governmental and non-governmental agencies on topics such as physician and midwife supply, organ transplantation, and information needed to evaluate the quality of health care plans. Network faculty and staff also played key roles in the development of BadgerCare.

The network's next major project is the development of the Population Health Information Resource for Wisconsin. It is impossible to improve public health and the quality of health care without a much more sophisticated system of data collection and information transfer to public and private sector decision-makers. The purpose of this information resource is to collect new data, unify and make more accessible existing public and private data sources, derive global measures of health and health-quality-of-life, and provide more detail on health care status and health resource utilization for small areas of the state. This would be a collaborative effort involving significant partnerships with the UW Center for Demography and Ecology, MCW and the Wisconsin Department of Health and Family Services. This effort, which could be a model for the nation, is an ideal project for the Blue Cross & Blue Shield initiative.

We are currently in the process of relocating the population-focused programs of the Departments of Preventive Medicine, Family Medicine, Medicine, and Pediatrics into a single site at the Wisconsin Alumni Research Foundation (WARF) Building. This relocation is underway, but additional funding is needed for program support and information technology and other infrastructure support. Eventually, the WARF building will house a virtual school of public health.

CONCLUSION

There is no doubt that the Blue Cross & Blue Shield of United gift will make its mark on the health of Wisconsin's citizens. The fund will allow both medical schools to increase the pace at which they add resources for prevention and wellness initiatives.

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Guest Editorial

Assessing Wisconsin's Health Needs and Priorities

by David A. Kindig, MD, PhD, and Philip M. Farrell, MD, PhD

The potential of significant new resources for Wisconsin's health needs that the Blue Cross/Blue Shield proposed conversion will make available raises the issue of how priorities for such resources will be set. Even though $250 million sounds like and is a lot of money, the interest this corpus would generate on an annual basis is less than three hundredths of 1 percent of Wisconsin's total health expenditures.[1] The Blue Cross/Blue Shield Board wisely specified that a broad process of priority setting take place, and the results of the public hearings are summarized elsewhere in this issue.

How would one think about the process of identifying state health needs? The word "need" itself is not commonly used in American health policy, in which market force concepts of supply and demand take prominence in fiscal and managerial policy. While market forces are wonderful catalysts for efficiency, they do not automatically work so well in areas of equity. We know that some states and counties are healthier than others, and that there are significant disparities in health across different ethnic groups and social classes in America.[2] If payment mechanisms were directly linked to producing health outcomes, market forces would find the areas of unmet "need," and the invisible hand would move in to meet such needs and profit at the same time.[3] Instead of HMOs seeking the healthiest patients for the profit that results, they would seek out the sickest as they would get more income for the most improvement in health.

Until such incentives can be designed and implemented, alternative mechanisms must be developed to fill in the equity or need gaps that market forces do not find and serve. The British health economists Alan Williams and Tony Culyer have added to our ability to think about "need" in the health care context.[4] They identify several ways need might be defined such as equal access or utilization levels, or equal health outcomes for everyone. Yet those who are healthy don't need as much health care, and therefore they settle on "need" being defined as the resources needed to eliminate the "capacity to benefit" from further investments.

This means that investments should not be made where an explicit increase in health outcomes is not expected. In addition, as the Wisconsin Check-Up article in this issue (p. xx) points out, health improvements are the product of multiple determinants, such as medical care, public health, education, income, the environment, and individual behavior.[5] In a resource-limited world, or state, this means that the different potential investments that have "capacity to benefit" need to be somehow ranked in terms of relative cost effectiveness in improving health outcomes.

We do not have enough knowledge or wisdom in 2000 for this to be an easy and objective task. From an objective perspective, we need as the first step the most useful and effective data as can be brought to bear on the question. The State Department of Health and Family Services has taken the lead on this for many years, and much of the data reported in this issue comes from the Center for Health Statistics and the Office of Health Care Information. Additional information is needed about health outcomes such as morbidity and disability, and how this varies across subpopulations. Different kinds of information are needed for different purposes; immunization rates and surgical outcomes for individual patients, "report card" scores like HEDIS for

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health plan quality, and summary health outcome measures like Years of Healthy Life or Disability Adjusted Life Years for populations.[6] Information is also needed on those subpopulations at high risk such as minorities, the disabled, and poor children. Such information has to be personalized to take account of preferences of individuals or subgroups. Similarly, more information is needed about costs and utilization in private health insurance coverage and health plans, with adequate proprietary and patient confidentiality protections; there is a two-fold variation in total per capita health expenditures across the states,[7] and undoubtedly such variation exists across Wisconsin counties and health care markets.

Subjective views are also needed, since objective data can never be completely adequate, and individuals and subgroups have important values and opinions and preferences about something as important as health and medical care. This is why the public hearing process is so important, as well as ways to solicit opinions from various stakeholders and individuals. In a separate process not reported here, the Advisory Board of the Wisconsin Network for Health Policy Research identified last spring the following issues as the most important in Wisconsin health policy in the coming 24 months: the uninsured in Wisconsin, the need for increased value (i.e. outcome per unit of resources expended) in Wisconsin health, privacy in health information, long-term care policy, and violence prevention.

Yet, neither objective data nor public opinion is alone adequate. Statistics can lie or be inadequate, but opinion can be uninformed or burdened with vested interests. Some mechanism for integrating both types of information is needed for resource allocation. Often the state legislature plays this role. One of the best state processes to date was that used in the Oregon Health Care Plan.[8] A technical objective process first identified those medical investments thought to be of most limited effectiveness, tentatively identified for elimination from coverage to provide effective to many more uninsured. But this list of priority treatments was then subject to a series of citizen discussion groups and the final list modified as the result of citizen input. In addition, a major challenge from the disability community in that state had to be resolved before the Clinton administration could approve the necessary Medicaid waiver.

So needs assessment in health is not easy, but it has to be done in association with community-based groups. It should be a careful process of objective and subjective information, with great wisdom and care taken in final decisions about allocation of precious resources. The ultimate framework should be need as "capacity to benefit" in producing longer lives of enhanced quality for all Wisconsin citizens; such broad outcomes must come from a properly balanced investment portfolio across the multiple determinants of health including medical care, public health, socioeconomic status, the environment, and individual lifestyle choices. A comprehensive strategy for assessing health needs and priorities offers the best opportunity to enhance our understanding and transform our system to one with the highest quality and outcomes for the dollars invested. Wisconsin already does well across the states on both counts. Better data and analysis can improve our performance even more, and be a benchmark for other states with similar goals.

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Guest Editorial

The Future of Public Health in Wisconsin, Revisited

by Patrick Remington, MD, MPH

Introduction

As potential public health initiatives to be supported by the Blue Cross-Blue Shield divestment are discussed, it is helpful to revisit the past. A decade ago, the Institute of Medicine published its landmark report *The Future of Public Health*.[1] In conducting this study, the Institute sought to take a fresh look at public health—its mission, its current state, and the barriers to improvement. The report boldly concluded that the nation had lost sight of its public health goals and had allowed the public health system to fall into disarray. Limited public health resources were used to provide health care to the poor and uninsured, and the public health community had neither a plan nor a vision to confront the emerging threats to the health of the public.

In order to meet the ongoing and emerging health needs of this country, the Institute challenged the public health community to focus its efforts on three core functions: assessment, policy development, and assurance.[1]

Assessment

Every public health department should regularly and systematically collect, analyze, and make available information on the health of the community, including statistics on health status and community health needs. Assessment includes surveillance, identifying needs, analyzing the causes of problems, collecting and interpreting data, case-finding, monitoring and forecasting trends, research, and evaluation of outcomes. This basic function of public health cannot be delegated.

Policy development

Every public health department should lead in the development of comprehensive public health policies by promoting the use of scientific knowledge in decision-making. Examples include planning and priority-setting, policy leadership and advocacy, provision of public information and encouragement of private and public sector actions through incentives and persuasion.

Assurance

Public health departments should assure their constituents that services necessary to achieve agreed upon goals are provided, either by encouraging actions by other entities (private or public sector), by requiring such actions through regulation, or by providing services directly.

What has been the reaction of the public health community in Wisconsin to the challenges set forth by the Institute of Medicine? Some in public health viewed the recommendations of the Institute as unnecessarily limiting the scope of their work and worried about losing the role of providing direct patient services, such as screening and health education. Others embraced the recommendations and saw the core functions as a way to focus limited public health resources and to build support in communities for public health. For them, this document provided a roadmap for the future.

In fact, most of the public health successes in the past century, as outlined recently by the Centers for Disease Control,[2] resulted from the core functions of assessment, policy development, and assurance. State and local health departments used surveillance and community assessment to identify and control infectious disease outbreaks, workplace injuries, and preventable injury deaths. Policies at the state and local level—school immunization laws, food service and labeling regulations, drinking and driving policies, and clean indoor air laws—have played a pivotal role in improving the health of children and adults. Finally, public health departments have worked closely with private health care providers to assure that children receive adequate immunizations and that pregnant women receive routine health care. These major public health accomplishments demonstrate the effectiveness of population-based approaches to disease prevention.

Despite the successes of the past, health departments today are challenged to continue to apply the core functions to the public health problems of 2000, such as tobacco use, poor diet, and physical inactivity, drug use, violence, depression, or environmental contamination. Addressing these complex social and cultural issues is not business as usual for public health departments, but requires different skills and different approaches.

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First, public health departments need better skills in epidemiology and community health assessment.[3] Traditional public health data systems—such as the national notifiable disease reporting system—were developed over the past century to protect the public health from infectious disease outbreaks. Now, as our understanding of the determinants of health have broadened to include social, economic, cultural, environmental, and genetic factors, so must our ability to examine a broader array of community-based health information.

The need for better assessment skills has become apparent over the past several years, as public health departments throughout the state conducted community health assessments. In response to the growing need for information at the local level, public health departments have begun to make data readily accessible for communities. For example, the Centers for Disease Control and Prevention now provides mortality data online that is free and easy to access and analyze (www.cdc.gov). The Wisconsin Department of Health and Family Services also provides detailed, community-specific information on the world wide web (www.dhfs.state.wi.us/stats), including census, natality, mortality, hospital discharge, and cancer registry data. Some communities have begun to collect risk factor data in their communities, which in the past has only been available at the state and national level.[4]

Now that the information is more readily available, public health departments need to have the skills and resources to access these data systems and to analyze, interpret, and use this information for health planning and program evaluation. Because of their small size, few local public health departments have the resources to hire and support a full-time epidemiologist. Thus, local health departments will need to work with the state and regional health departments, universities, and health care organizations to be able to conduct comprehensive, accurate, and useful community health assessments.

Second, public health departments must continue to build strong and lasting partnerships with the medical care providers in their communities. In the past, many public health problems could be addressed through local or state governmental intervention alone. For example, the public health policies developed to control infectious diseases—such as laws to inspect restaurants or to report workplace injuries—were in the domain of state and local government. These local governmental policies cannot address fully today's complex health problems. Many require non-governmental policies, such as quality improvement initiatives in health care or the regulation of television programming directed toward children.

The need for these partnerships has been recently highlighted by the national "Medicine/Public Health Initiative," devoted to the joining of medicine and public health.[5] The initiative brings together leading organizations and individuals concerned about health and health care, to develop an agenda of action that cooperatively engages public health and medicine in reshaping health education, research and practice. In Wisconsin, public health and medicine have collaborated on projects to improve immunization rates in Milwaukee, provide health care to the poor in Madison, reduce tobacco use in La Crosse, implement Medicaid managed care throughout the state, and implement diabetes guidelines statewide.[5,6]

In order to build on these successful partnerships—especially in working with larger health care plans—public health must work across traditional governmental jurisdictions. Wisconsin has over 100 local public health departments that are county- or city-based, many consisting of only a few employees. In contrast, larger health care organizations provide care to patients residing in many counties or entire regions of the state. Community-based approaches in the future may require the establishment of new public health entities, through the development of regional public health boards or consortia.

In conclusion, public health departments have been the driving force behind population-based strategies to improve the health of Wisconsin's citizens. To continue the successes of the past century to the next, public health must retool the workforce to gain better skills in the core functions of public health. In addition, public health departments must develop new approaches and build strong and viable partnerships with the health care community. All of these efforts must build on the three core functions of public health of assessment, policy development, and assurance. The Institute of Medicine has provided a road map for the future of public health—the Blue Cross/Blue Shield initiative provides a vehicle to continue the journey.

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Guest Editorial

Medicine and Public Health: Imagine...

by Seth Foldy, MD, FAAFP

The recognition that our nation's high medical costs yield only mediocre public health outcomes has reawakened interest in the relationship of medical care to public health. I've had the opportunity to study this relationship from both sides of the stethoscope.

Sadly, a chasm has separated the two for many decades. After all, medicine has been forced to support itself primarily as a business (by default, since no more rational delivery system has overcome political inertia). Meanwhile, public health agencies have enjoyed tax support—although "enjoyment" has been meager in the teeth of the taxpayer rebellion. As Medicaid and Medicare have consumed ever-larger pieces of the public dollar, understanding and support for traditional public health functions have further declined. ("Isn't that what we pay the doctors for?")

Thus natural allies of health often regard one another suspiciously across a profound culture gap. The gap is aggravated by outdated expectations that both physicians and public health professionals hold of one another, leading to frustration and blame. The public health nurse may not understand the increasing cost and time constraints health care providers face in the highly competitive medical marketplace. Meanwhile, doctors and hospital nurses may imagine unrealistic public health capacity to aid patients at home or school, oblivious to diminished budgets, the rise of commercial home health services and many other factors.

Medicine and public health have much to offer one another once real dialogue replaces presupposition. Is the effort worthwhile? I have no doubt. The physician, clinic and hospital have immense power to diagnose and treat, but also prevent. The preventive clinical armamentarium grows larger every day (vaccines, counseling, screening, prophylactic medication), although policy struggles must be fought and won to provide support for and access to clinical preventive services.

Public health is unique in its capacity to address environmental quality, foster community-wide awareness, link families to needed services, forge crucial information links, and monitor community progress toward disease and injury control. Imagine for a moment that we who practice medicine and public health join our mutual strengths to continuously improve health outcomes for patients, families and entire communities. Imagine that...

...each physician's diagnosis of communicable or environmental disease is easily, rapidly and accurately added to a dynamic disease surveillance system that alerts public health officials of outbreaks and epidemics. And imagine that timely, accurate data on "what's going around" is rapidly transmitted back to the physicians in the trenches.

...each family lacking insurance or a primary care medical home is identified and guided to appropriate programs by both public and private community agencies. And imagine that health care providers and public health professionals work together to create sufficient care capacity for all members of the community—insured or not.

...jointly-developed protocols assure consistent care and coordination of services for children with lead poisoning, tuberculosis patients, high-risk pregnancies and persons with sexually transmitted diseases. Physician, nurse, and environmental sanitarian all know in advance what role each other will play.

...doctors and public health workers unite to advocate for the clean-up of hazards like lead paint *before* children are affected, and similar prevention policies to protect our patients.

Doctor Foldy is Commissioner of Health, City of Milwaukee, and Associate Clinical Professor, Family and Community Medicine and Health Policy Institute, Medical College of Wisconsin.

...a child's immunization record is available on-demand, electronically, to anyone providing care for the child. And imagine that the same program automatically sends out patient reminders for upcoming or missed immunizations.

...that advice in the physician's office for lifestyle change is supported at work, school and in the community by public health agencies and community organizations.

...health care providers, public health workers and community agencies plan together for the systematic elimination of uncontrolled hypertension, preventable injuries, and delayed prenatal care. And imagine an information system linking public health data and clinical care statistics that tracks progress continuously until these joint goals are achieved.

I have glimpsed fragments of each of these visions in Wisconsin. They will not be achievable if public health and medicine force each other into old preconceived roles. Nor will they be achievable without building *systems* of cooperative work.

Establishing such systems requires new skills like information systems management, community planning and epidemiology. They also require new investments in both technology and training. We cannot build these systems together if we cannot share information freely while respecting privacy and confidentiality.

Nothing I've suggested is beyond reach. One important possible product of the Blue Cross & Blue Shield United of Wisconsin Public Health Foundation would be the creation of common ground where medicine, public health and community advocates envision and plan new ways to work together.

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Guest Editorial

Building Effective Partnerships with Wisconsin Communities

by Cheryl A. Maurana, PhD

Partnerships between communities and academic health centers can be powerful tools for improving health. This article provides a brief overview of partnerships developed by the Center for Healthy Communities at the Medical College of Wisconsin (MCW), and describes elements that are essential for building mutually beneficial, effective, and sustained partnerships.

Center for Healthy Communities Partnerships

The mission of the Center for Healthy Communities at MCW is to build community-academic partnerships to improve health. The Center, which is part of the Department of Family and Community Medicine, has a number of community partnerships, both urban and rural.

The Cancer Prevention Initiative is a collaboration between the MCW Cancer Center, the Center for Healthy Communities, the Milwaukee Housing Authority and S.E.T. Ministry, Inc. This program is designed to increase awareness of cancer and to develop culturally appropriate prevention activities for residents of Milwaukee public housing. The initiative employs a community health advocate model that uses social networks and trusted opinion leaders to effect healthy lifestyle changes. The advocates are public housing residents who were selected and trained to support and educate other residents.

The foundation of the Center's rural focus is the Marion Area Coalition for Healthy Communities, a collaboration with the Marion area in east central Wisconsin. This partnership involves schools, churches, health care providers, local government and civic groups in addressing community-identified problems related to multi-generational substance abuse. The Center's long-term goal is to develop a network of rural community partnerships focused on health.

The Healthy Aging Initiative advances the health of older adults by working with community organizations to develop programs that increase gerontological health education and services in underserved communities. The initiative also includes several research programs focused on health issues facing community elderly including dementia and care-giving, health literacy, and death and dying.

The Center has also developed several programs that provide medical students with opportunities to interact with, and learn from, members of the community they may one day serve. These programs also help to provide underserved youth with a vision for the future. For example, the Rural and Urban Ambassador programs place medical students in elementary and high schools in Milwaukee and around the state. The medical students encourage under-represented youth to consider a career in medicine and other health professions, and also discuss health topics of interest to teens. High school students also come to MCW for hands-on experiences and discussions with medical students and faculty. Our long-term goal is to educate students from underserved urban and rural areas who will then return to their communities to practice.

Another Center program allows medical students and residents from MCW's five Family Medicine residency programs to meet with elderly residents in a Milwaukee public housing development. This program, called Chat and Chew, provides information to housing residents about various health issues that they have identified.

Elements of Effective Partnerships between Communities and Academic Health Centers

Building effective partnerships between communities and academic health centers requires three elements: (1) adhering to a set of partnership principles; (2) recognizing that partnerships go through various stages; and (3) creating a written partnership agreement.

Principles of Partnership

Making a commitment to an agreed-upon set of principles is a

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critical first step for the long-term success of a partnership. These principles include developing common goals, building trust and respect, emphasizing strengths and assets, and focusing on community-identified needs. Open communication and continuous feedback are also critical, as are flexibility to evolve and shared credit.

A focus on goals rather than grants is critical to the success of a partnership. For example, in the early phase of the Center for Healthy Communities' partnership in Marion, the partners submitted a substantial grant proposal to a large foundation. Although it was not funded, the partnership moved ahead, refining goals and objectives, and looking for other funding sources. The program received some small grants to begin its work, and a year later, received a large five-year federal grant as part of the Drug-Free Communities Program.

Stages of Partnership Development

When communities and academic institutions build relationships, it is important to understand that the partnership development goes through several stages. These stages allow partners to become better acquainted, build trust, define common goals and objectives, and develop ways to sustain the partnership and expand progress. For example, when the Center began its partnership with the Housing Authority and S.E.T Ministry, Inc. to work on the cancer prevention initiative, there was an existing grant focused on mental health, aging, employment, and substance abuse. Rather than having two separate programs and duplicating scarce resources, efforts were consolidated to be more effective.

Sharing resources is also a key element of our partnership. Center staff developed a training program for the community advocates with such topics as advocacy, conflict resolution, team building, definition and determinants of health, cancer prevention, and available resources. The training was a combination of presentations, group activities, informal discussions and reflective writing.

Written Partnership Agreement

Using the principles of partnership as a guide, a partnership agreement template lays the groundwork for success. This agreement clearly identifies goals and objectives, and roles and responsibilities of each partner, along with well-defined measurable outcomes, evaluation plans and mutual benefits. For example, roles and responsibilities are clearly laid out in the Center's work with the Milwaukee Housing Authority. Meetings are very structured, with agendas and tasks outlined. Next steps are clearly identified, including who is responsible for each task. In addition, the community advocates use rules of Total Quality Management in their work.

Power of Community–Academic Partnerships

Based upon the work we are doing in partnership with Wisconsin communities, we have learned three important lessons.

First, *leadership* is key to sustained health improvement, and there are many different types of leaders, both community and academic, who must be cultivated. Second, more can be done by working together as *partners* and pooling limited resources than by working separately and often duplicating each other's work. Third, although communities have many needs, they also have many strengths, and individuals must become *empowered* to capitalize on those strengths to build community and individual self-sufficiency.

Community-academic partnerships must be built on the foundation of community health development, a concept that is analogous to economic development. Just as it is important to develop the economies of our cities and towns, it is also important to develop the health of our communities. Partnerships must be built on the premise that working together, communities and academic institutions can accomplish more than working separately. A community-academic partnership makes it possible to capitalize on the strengths that both communities and academic health centers bring to the table.

Perhaps the outcome of such a partnership can best be expressed by a quote from the anthropologist Margaret Mead: "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed it is the only thing that ever has."

Community academic partnerships can create and support those small groups of citizens throughout Wisconsin. Those groups can then be powerful tools for creating healthier communities.

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Wisconsin's Population Health

Donald L. Libby, PhD, Trudy Karlson, PhD, and David Kindig, MD, PhD

INTRODUCTION

How do we know if the population of Wisconsin is healthy? For years, policy makers have relied on objective measures, routinely collected and widely used. These data come primarily from birth and death certificates, but in Wisconsin they are also supplemented by information from hospitals and from telephone surveys about health related behaviors.

Population health is a concept that includes both the length and quality of life of individuals as well as the overall condition of all people in a population. The determinants of population health are depicted in Figure 1 in the model proposed by Robert Evans and Gregory Stoddart. The traditional "medical model" of health care, the shaded area in Figure 1, focuses primarily on the individual with a disease or health care need, seeking out available health care or a cure to restore the individual to good health. The population health paradigm places the individual's health and health care within the context of multiple determinants of health. This wide scope offers opportunities for finding cost-effective means of improving a population's health state and general level of well being. While health care and medical cures remain essential elements, they are complemented by attention to other factors, including the physical and social environment, individual behavior and life style as well as genetic endowments.

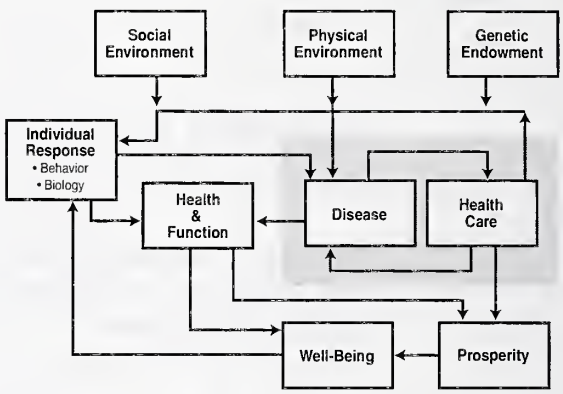
THE STATE OF THE STATE

Wisconsin is part of a midwestern cluster of states whose populations have among the longest life expectancy in the United States, even when adjusted for the age and sex composition of the population.

In 1997 the Wisconsin Network for Health Policy Research investigated how Wisconsin compared to other states on many determinants. Wisconsin ranked mid-way in the distribution of states on most population health indicators (Figure 2). On the positive side, we do an exceptional job of providing health insurance with among the lowest percentage of population without medical insurance and the highest rates of enrollment in managed care organizations. Unfortunately, Wisconsin also has exceptionally high rates of binge-drinking, driving while intoxicated, and overweight adults.

Authors are with the Wisconsin Network for Health Policy Research, Department of Preventive Medicine, University of Wisconsin School of Medicine.

Figure1. What is Population Health?



Why are some people healthy and others not? R.G. Evans, M.L. Bar er and T.R. Marmor, eds. New York Aldine de Gruyter, 1994.

WISCONSIN'S COUNTY CHECK-UP

Some decisions that will affect population health are made by individuals, local governments, and local organizations. The County Population Health Check-up, a collaboration with the Bureau of Health Information at the Wisconsin Department of Health and Family Services, was distributed by the Network in 1999 and shows some examples of population health measures currently available at the county level. Unfortunately, many of the behavioral risk factors that were important for the health of the state—drinking while driving, binge-drinking and overweight adults are not known for all counties. Figure 3 presents some examples of how these measures vary among Wisconsin counties.

Figure 2. Population Health Indicators: Comparison with Wisconsin

Population Health Indicators	Data for fifty states			Wisconsin's rank among 50 states
				Healthiest ◄ ► Leost Healthy
Health Outcomes	**Highest**	**WI**	**Lowest**	1 10 20 30 40 50
Age-adjusted adult respiratory disease deaths per 100,000 persons, 1994	182.6	115.0	78.9	UT 4 NV
AIDS cases per 100,000 persons, 1995	69.2	7.2	1.1	ND 10 NY
Age-adjusted deaths per 100,000 persons, 1994	988.4	778.6	655.6	HI 13 MS
Age-adjusted motor vehicle accident deaths per 100,000 persons, 1994	32.3	15.0	7.5	RI 15 MS
Percent of live births low birthweight, 1993	10%	6%	5%	AK 15 MS
Age-adjusted suicide deaths per 100,000 persons, 1994	23.7	12.0	7.1	NJ 16 WY
Average days in past month physical health "not good", 1994	3.8	2.9	2.2	KS 29 WV
Medical Care Factors				
Percent of population uninsured, 1994	24%	9%	8%	ND 2 TX
Percent of population enrolled in HMO, 1994*	36%	23%	0%	MA 10 WY
Percent of mothers receiving late or no prenatal care, 1993	9%	4%	2%	NH 20 NM
Short-term general hospital inpatient days per capita, 1994	1.7	0.8	0.4	TX 22 ND
Per capita personal health care expenditures, 1993*	$3,892	$2,875	$2,068	MA 23 ID
Percent of children age 19-35 months fully immunized, 1995	86%	74%	59%	VT 25 MI
Percent of population underserved by primary care, 1994	27%	12%	3%	HI 33 MS
Behavioral Factors				
Births to teens as percent of live births, 1993	21%	10%	7%	NH 12 MS
Percent of population using safetybelts, 1994	84%	64%	32%	HI 24 RI
Percent of adults who smoke, 1994	29%	23%	16%	UT 27 NV
Percent of adults overweight, 1994	32%	30%	20%	HI 47 MS
Percent of adults (age 18+) who drink and drive, 1993	5%	5%	1%	MD 50 WI
Percent of adults who binge drink, 1993	23%	23%	4%	TN 50 WI
Socioeconomic Factors				
Percent of income earned by top 20% of households, 1990	50%	44%	43%	NH 5 MS
Percent of adults age 25+ with high school or more education, 1990	87%	79%	64%	HI 21 RI
Per capita income, 1994	$29,018	$20,870	$15,828	UT 21 NV
				1 10 20 30 40 50
				Healthiest ◄ ► Leost Healthy

*Ranked from highest to lowest, not necessarily from "healthiest" to "least healthy"

These data and others are now becoming accessible on the Internet for localities interested in how their counties are doing on important determinants of health. Working in collaboration with the Bureau of Health Information, the Network is making population health data available on the web. Watch our website for a population health database that includes information for all Wisconsin counties on health status, health care capacity, health care use and social and demographic measures (www.medsch.prevmed/network).

Determinants of health interact in complex ways that are not always apparent. For example, we can investigate the relationship between counties' mortality rates and measures of economic well being. (Figure 4B). Each dot on the graph represents an individual county, and its age-adjusted death rates for the population under 75 as well as its per capita personal income. The downward sloping line suggests that counties with higher per capita income tend to have lower mortality rates. As another example, when we look at the relationship between county mortality rates and rates of health insurance coverage, we see that counties with a high percentage of households lacking insurance tend to have a higher county mortality rate. (Figure 4B)

Of course, the relationship between mortality and these factors is not as simple as these figures suggest. To begin with, aggregate data at the county-level do not always give reliable estimates of the correlation between mortality and socioeconomic variables at the individual level of analysis. Secondly, mortality, although easy to measure,

Figure 3A. 1996 Age Adjusted Mortality for Persons Under 75 Years. Deaths per 100,000 population.

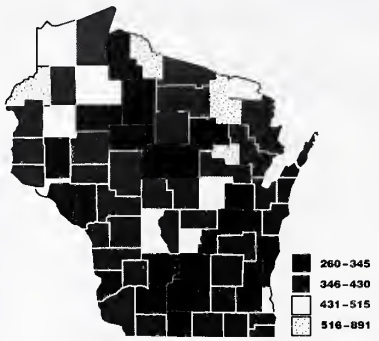


Figure 3B. 1996 Personal Income Per Capita. Average income for persons in the county.

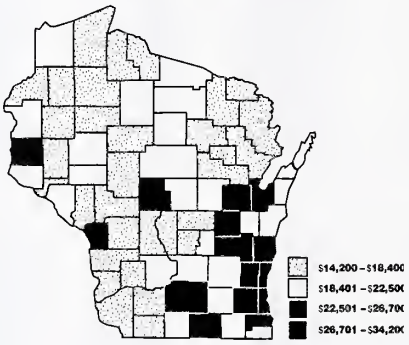


Figure 3C. 1996 Inpatient Hospital Discharges for Alcohol and Other Drug Abuse. Discharges of county residents 100,000 people.

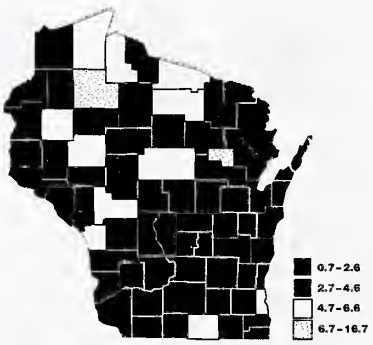


Figure 3D. 1993-1994 Percent Uninsured. Proportion of the population that did not have Health insurance.

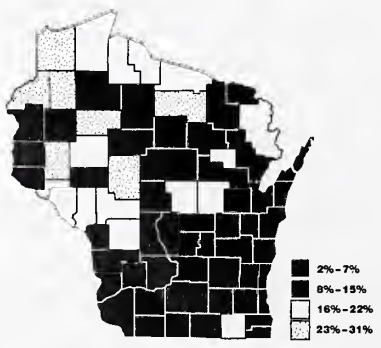


Figure 4A. Mortality by Income

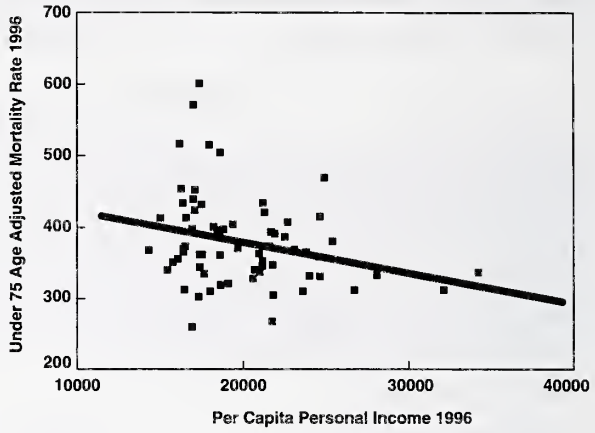
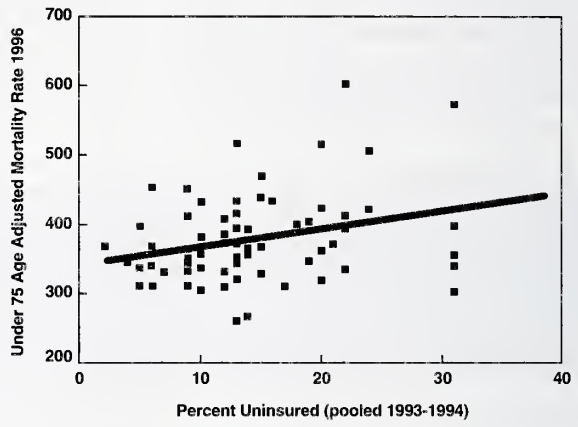


Figure 4B. Mortality by Percent Uninsured



may not be the best measure of a population's health, especially if we want to consider the quality of life. And these graphs show just a few isolated variables, when we know that a population health framework is a much more complex mixture of multiple interacting variables. The Department of Preventive Medicine at the University of WisconsinMadison has started a Population Health Graduate Program where students and faculty study underlying relationships and measures to better understand how the population of Wisconsin can live healthier lives.

Preliminary Progress Report

The Rural Women's Health Study: Health and Behavior of Farm and Nonfarm Resident Women

Elaine D. Eaker, ScD, Laura M. Wittman, and Robin E. Bergs, BS

The deficit of information regarding women in clinical and epidemiological research has gained attention over the past 10 years.[1] In many instances, health recommendations resulting from clinical trials or observational research are based on the study of men.[2,3] More recently, with the development of the US Public Health Service Office on Women's Health and the Office of Research on Women's Health at the National Institutes of Health, attention and resources have come to bear on health issues pertinent to women. Very little attention and resources, however, have been directed toward women living in rural environments; they are a neglected population. Although 30% of all women in the United States live in what is considered a rural setting, these women have not been well studied or characterized.[4]

Women living in rural settings are a diverse group. Issues and concerns vary by socioeconomic status, geographic location, farm and nonfarm residence, ethnic status, cultural background, health status, and environmental conditions such as climate. There are a number of common conditions that contribute to the health and welfare of women in rural settings. These include unemployment or underemployment; higher rates of economic deprivation; lower educational levels; reduced earnings; multiple role expectations; displacement due to a spouse's illness, death, or divorce; lack of anonymity; feelings of being trapped; isolation; and time strains. To the extent these conditions adversely effect rural women's physical and psychological health is not known.[4]

PURPOSE

The Rural Women's Health Study (RWHS) was established to address the deficits in information regarding the health and behaviors of women living in a rural environment. Usually populations being studied are loosely defined as "urban or rural" which is too general for many questions regarding lifestyle, role expectations, occupational status, medical care utilization, health status, and risk factors. For this reason, we have designed the RWHS to characterize and compare women living on farms and women not living on farms in northcentral Wisconsin on a number of physiologic and behavioral characteristics. We are identifying and characterizing the health, risk factors, and risk behaviors of women aged 25 to 75 years living in a rural environment that we have further defined by farm residency status. The RWHS will lead to a better understanding of the differences and similarities in physical and psychological needs between farm and nonfarm women. If differences are observed between rural farm residents compared to rural nonfarm residents, strategies can be devised to better target these populations of women. We will also facilitate prevention and treatment measures against chronic disease and disability among these women by first examining and comparing their lifestyles, health care needs, and risk factors. In addition, determining the social and psychological stressors in these women's lives will help us devise ways to improve women's well being.

This study will compare farm women to nonfarm women for:

1) the prevalence of risk factors such as smoking, body mass, body fat distribution, blood pressure, dietary intake, physical activity, and physical functioning;
2) the extent of social and psychological stress, isolation, well-being, occupational status, and strain; and
3) differences in health care access and utilization, and mobility in residence.

These characteristics will also be correlated to the current health status of these women. In order to take full advantage of the population-based nature of this research, we will link these women to their disease status and medical care utilization files and calculate rates of disease, risk factors, and medical care utilization in this rural population.

Authors are with the Marshfield Medical Research and Education Foundation, Marshfield Epidemiology Research Center, Marshfield, WI. Funding provided by the Centers for Disease Control and Prevention/National Institutes of Occupational Safety and Health, Grant # (U07/CCU507126). Reprint requests to Elaine D. Eaker, ScD, Marshfield Medical Research and Education Foundation, 1000 N Oak Ave – ML2, Marshfield, WI 54449-5790, 715.389.4148; Fax 715.389.3880.

METHODS

Marshfield is located in a rural region of central Wisconsin. Economically, the area depends heavily on farming and manufacturing, with dairy farming comprising the majority of the agricultural activity. The Marshfield Clinic is a 550-physician multi-specialty group medical practice, which was founded in 1916 as one of the first group practices in the country. The main clinic facility in Marshfield is contiguous to St. Joseph's Hospital, which is the only hospital in the Marshfield area. The clinic and hospital share a joint single unit record for each patient. Certain elements of the medical record, including diagnoses, procedures, and costs are stored in computerized files dating back to 1961. Complete medical care coverage of an entire population, coupled with the combined medical record of the hospital and clinic and computerized diagnoses and other databases, provide substantial opportunities for population-based health studies.

The Marshfield Epidemiology Research Center of Marshfield Clinic has recognized the methodological advantages in establishing a resource for population-based health research in the form of the Marshfield Epidemiologic Study Area (MESA). A paper describing the selection of geographic region by Zip codes and validation processes has been published.[5] The MESA region surrounding the Marshfield Clinic/Saint Joseph's Hospital represent 14 Zip code areas. MESA was developed in order to conduct longitudinal follow-up studies of individuals living in a defined geographic region. The following characteristics are present in the MESA database:

1) a high level of coverage of a well-defined population;
2) the ability to prospectively track individuals daily and hence produce a highly accurate and timely denominator;
3) high levels of ascertainment of health events through a combined inpatient and outpatient medical record;
4) a unique identifier for each individual living in MESA and receiving care through the Marshfield Clinic system; and
5) the availability of high-quality diagnostic and treatment information on individuals in the population. Based on a daily tracking system and regular (every three years) validation of addresses and medical care coverage, we know that over 90% of all health events are captured by the MESA system.

The 14 Zip code MESA region is comprised of 29,282 males and 29,512 females. The farm residency cohort is a further delineation of all residents of the MESA area with 2191 males and 1883 females comprising the farm residency population. The first farm and nonfarm residency delineation of the population took place between December 1991 and May 1992. This list was complied by using source lists involving agriculture and farming. These included being on any one of the following: motor vehicle licenses specified as "farm vehicle," the Brucellosis Registry (Milk Producers List), receiving "Agri-View," or receiving US Agricultural Stabilization and Conservation payments. A special telephone census of all potential farm residents and medical record linkage to families was also used. This residency list was updated in collaboration with the Wisconsin Agricultural Statistics Service (WASS). WASS matched their form list to a list of all residents of MESA.

For the RWHS the 14 Zip code MESA area was used as a sampling frame. After stratifying by farm residency status we randomly selected equal numbers of women currently living on farms and women not living on farms. The overall goal is to recruit and examine 1500 women, half from farms and half not living on farms. To date we have recruited and examined 840 women. This represents a 70% response rate.

The baseline examination of each woman includes the measurement of blood pressure, body fat distribution, height, and weight. Data collected from fasting blood consist of thyroid stimulating hormone, total cholesterol, HDL-C, LDL-C, glucose, insulin, cortisol, fibrinogen, and Factor VII. Extensive surveys gather information on smoking, dietary intake, reproductive health, medical history, physical activity, occupation, income, and educational level. We are also assessing physical activity, levels of social support, symptoms of depression, marital satisfaction, occupational strain, and symptoms of anxiety and tension.

PROGRESS REPORT

At the baseline examination we were able to recruit and examine 419 farm and 421 nonfarm resident women in the age group 25 to 75 years.

Because of the apparent differences in lifestyle, it is important to elucidate the risk factors for chronic diseases in these two populations. We are assessing cigarette smoking, the presence of hypertension, diabetes, elevated lipids, dietary intake of saturated fat, physical inactivity, waist-to-hip ratio, and psychosocial stresses. We are also able to determine the patterns of health care utilization and the type of insurance (if any) these women have. Patterns of utilization can be broken down by emergency room, out-patient and inpatient visits, in addition to preventive services received such as mammograms and Pap tests.

We are currently in the process of bringing these 840 women back for a 3-year follow-up examination. We are interested in detecting risk factor changes over time as well as residency changes. For this follow-up exami-

Table 1. Age-adjusted six and one-half year incidence rates/1,000 person-years of selected diseases clinically diagnosed among farm and nonfarm women: the Marshfield Epidemiologic Study Area

	Farm residents			Non-farm residents		
Condition	Person-years	Rate	95% C.I.*	Person-years	Rate	95% C.I.*
Malignant neoplasms (ICD-9 140–208.9)	12,508	6.7	4.3, 9.0	138,184	7.8	7.3, 8.3
Breast cancer (ICD-9 174-174.9)	12,888	1.9	0.9, 2.9	144,510	1.9	1.7, 2.1
Ischemic heart disease (ICD-9 410, 411, 413-414.99)	12,680	5.7	3.5, 8.0	139,112	7.6	7.1, 8.1
Stroke (ICD-9 430-437.9, excluding 435)	12,834	3.6	2.1, 5.1	142,259	5.8	5.4, 6.2
Diabetes (ICD-9 250-250.99)	12,597	5.6	2.6, 8.7	139,709	4.5	4.1, 4.9

*Confidence Interval

nation we have added a 12-lead ECG to detect subclinical myocardial infarctions and cardiac arrhythmia. When this follow-up examination is complete we will begin recruiting the remainder of the 1500 women needed for this study.

PRELIMINARY FINDINGS

In order to determine if farm women and nonfarm women have similar or different rates of major illnesses, we utilized the entire MESA population of 29,512 women living in the 14 Zip code MESA area to conduct preliminary analyses comparing farm and nonfarm women on the incidence and prevalence of selected diseases.

Table 1 presents the age-adjusted 6.5 year incidence rates/1000 person-years for selected diseases that were clinically diagnosed between July 1, 1991 to December 31, 1997. Prevalent cases were eliminated from June 30, 1991 back through January 1, 1979. We used the electronic diagnoses files based on the International Classification of Diseases (version 9) to define the cases of a given illness. The data are stratified by farm residency status. As can be seen, farm women have slightly lower incidence rates of total malignant neoplasms and ischemic heart disease, but these differences do not reach statistical significance. They also experience the same incidence of breast cancer as nonfarm women and a slightly higher rate of diabetes. The development of stroke, however, is significantly lower among farm women, 3.6/1000 person-years (95% confidence interval [C.I.]: 2.1, 5.1) compared to nonfarm women, 5.8/1000 person-years (95% C.I.: 5.4, 6.2).

Table 2 presents the prevalence rates for the same diseases among farm and nonfarm women. Similar to the findings regarding incidence rates, farm women have consistently lower prevalence rates of these selected diseases. However, the only difference to reach statistical significance is ischemic heart disease where the rate for farm women is 34.4/1000 women (C.I.: 24.8,44.1) and for nonfarm women 49.4/1000 women (C.I.: 47.1,51.8).

Table 2. Age-adjusted prevalence rates/1000 persons (as of 1/1/98) of selected diseases clinically diagnosed among farm and nonfarm women: the Marshfield Epidemiologic Study Area

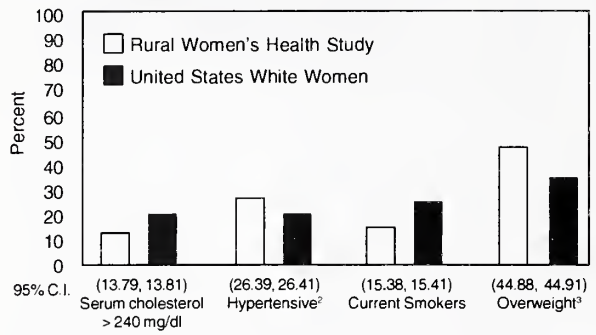
	Farm resident n=1883		Non-farm resident n=27,629	
Condition	Rate	95% C.I.*	Rate	95% C.I.*
Malignant neoplasms (ICD-9 140–208.9)	52.8	41.4, 64.2	57.0	54.4, 59.6
Breast cancer (ICD-9 174-174.9)	11.7	6.6, 16.8	16.6	15.1, 18.1
Ischemic heart disease (ICD-9 410, 411, 413-414.99)	34.4	24.8, 44.1	49.4	47.1, 51.8
Stroke (ICD-9 430-437.9, excluding 435)	26.8	17.7, 35.9	30.1	28.2, 31.9
Diabetes (ICD-9 250-250.99)	44.0	33.0, 54.9	48.8	46.4, 51.3

*Confidence Interval

We next compared our population (1995-1996) with that of women in the United States (1988-1994) for selected risk factors. Because over 98% of the women in our population are nonhispanic whites, we compared the women in the RWHS to white women in the United States.[6]

Figure 1 compares the age-adjusted percentages of women in the RWHS to women in the U.S. for five risk factors. As can be seen, the percent of women in the RWHS with total serum cholesterol levels of greater than or equal to 240 mg/dL is significantly lower than white women in the United States. Our population of rural women also have significantly lower rates of cigarette smoking compared to U.S. white women. With regard to hypertension, however, the women in

Figure 1. Comparison of Women in the Rural Women's Health Study to White Women in the United States: Age Adjusted[1] Percentages



[1]Age-adjusted to white women in the United States

[2]Systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHG or taking anti-hypertensive medication

[3]Body mass index > 27.3 kilograms/meters^2

the RWHS are significantly more likely to be hypertensive compared to women in the U.S., and they are also more likely to meet the criteria for being overweight.

DISCUSSION

The Rural Women's Health Study is, to our knowledge, the only in-depth health research in existance of women living on farms compared to women not living on farms. In the central region of Wisconsin most farms are relatively small family-owned businesses. We are finding with each passing year that an increasing number of families are leaving family farms for a number of reasons. It is essential that we document this lifestyle and determine aspects that may lead to better or worse health status and quality of life compared to women who do not live on farms.

As can be seen from our preliminary data, it appears that women living on farms may be healthier for some disease outcomes compared to other women. This observation, however, may be due to other factors and not accurately reflect their true health status. For example, there may be a selection process where women who are healthier choose to become or remain farm residents. Another reason may involve our use of clinically-defined events. If farm women consistently underutilize the medical care setting, we may miss less serious health events. The RWHS will be instrumental in understanding and clarifying this situation.

Other data we will begin to examine in-depth deal with daily tensions, multiple responsibilities, economic hardship, social supports, physical exertion, dietary intake of nutrients, medical care utilization, reproductive health and marital relations. All of these characteristics may impact a women's health status and may help explain any differences we observe between farm and nonfarm women.

SUMMARY

This study of farm and nonfarm women is unique for several reasons:

- the study is population-based allowing us to calculate rates of disease and risk factors in a rural population;
- the enumerated population receives its health care from one medical care system and participants in the RWHS will be linked to medical care utilization and outcomes;
- women are recruited based on farm residency so that careful comparisons can be made between women living on farms and those not living on farms;
- extensive physical examinations and psychosocial surveys are conducted on each woman in order to obtain accurate and standardized health, lifestyle, and risk factor information.

ACKNOWLEDGMENT

We are very appreciative to the many women who have agreed to participate in this unique research effort. We look forward to analyzing and reporting the baseline data and our continued recruitment of women.

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Behavior Changes & Disease Prevention: MCW Research Shows Effectiveness of HIV/AIDS Risk Reduction Interventions

Jeffrey A. Kelly, PhD

ABSTRACT

Many of the diseases that cause premature illness and death—including some cancers, heart disease, and AIDS—could be prevented if persons made behavior changes to reduce their risk for developing the illnesses. Over the past two decades, there have been great advances in our scientific understanding of how to promote health risk behavior change. This paper briefly reviews elements and examples of effective behavior change interventions, including programs that can be offered in service settings as well as community-level interventions. The prevention of diseases through behavioral public health interventions requires the investment of funds but can reduce burdens on health care systems, reduce the human toll caused by premature deaths, and be highly cost-effective.

A remarkable number of diseases could be prevented if individuals were effectively assisted in changing the risk behaviors responsible for those illnesses. The causal association between cigarette smoking and lung cancer, other pulmonary diseases, and cardiovascular disease is well-known, and millions of premature deaths could be prevented if people stopped smoking cigarettes. Deaths due to cardiovascular disease could be dramatically reduced if persons made behavioral and lifestyle changes to improve their fitness through exercise, obesity reduction, and maintenance of low blood cholesterol levels. The World Health Organization estimates that over 45 million persons worldwide have already contracted HIV infection, and nearly 1 million of these cases are in the United States. Over 40,000 Americans continue to contract HIV infection each year. Virtually every new case of HIV infection is preventable if individuals at risk made changes in their sexual or drug use practices. While lung cancer, cardiovascular disease, and AIDS are three of the clearest examples, persons' behavior plays a direct or a contributing role in the development of many other diseases that cause premature death or that worsen health and life quality.

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Recognition of the link between behavior and preventable illness—and recognition that enormous health, economic, and quality of life benefits could be realized through healthier behavior patterns—is not new. We have known all of this for a long time. We have also known for a very long time that helping people to successfully change risky behavior habits is often very difficult.

Over the past 20 years, a field of scientific study and applied practice has developed with the purpose of better understanding why persons engage in health risk behavior patterns and developing approaches to help people change these patterns. Under the rubric of "behavioral medicine," this field makes use of behavioral science theory and behavior change techniques applied to health and disease prevention.

WHY DO PEOPLE DO RISKY THINGS WHEN THEY KNOW BETTER

Educating people about health threats caused by behavior has always been the first line of prevention efforts. For some persons, a little education is enough to encourage behavior change. But for many people it isn't enough. Most smokers are well-aware of the health risks due to smoking, most overweight people are aware that eating less and exercising more will help them to reduce weight, and most Americans are well-aware of how HIV infection is transmitted and how it can be avoided. Factual knowledge about health risk behavior may be necessary, but it is usually not sufficient to produce behavior change. This is especially true for persons whose risk behavior habits are well-established and longstanding. It is also especially true when the immediate consequences of a behavior are pleasurable and when the health threat posed by the behavior is distant and far-removed. This is the case for smoking, overeating, drinking, drug use, risky sex, and most of the other patterns of concern in the primary prevention of disease.

Psychological theory which underlies the field of behavioral medicine has shown that approaches for assisting persons to change health risk behavior must

Table 1. Characteristics of Effective Health Risk Reduction Interventions

Key Element	
Risk behavior education	What behaviors confer risk and what behavior changes will reduce risk?
Threat sensitization	Bad things don't happen only to other people. They could also happen to me.
Positive attitudes toward behavior change	Benefits that I will experience if behavior change I make changes in my behavior, and the belief that the benefits will exceed the costs of change.
Strength of behavior change intentions	Commitment to enacting change.
Perceived self-confidence	Belief that I am able to successfully make changes in my behavior.
Risk reduction behavioral	Presence of skills needed to enact behavior skills change.
Normative supports	The perception that avoidance of risk behavior is the accepted standard among people who I like.
Reinforcement of change	Efforts of behavior change are reinforced by efforts those around me (and self-reinforced by me).

extend beyond education alone and address other factors that maintain these patterns. One approach to risk behavior change involves counseling techniques that focus on the individual. Successful individual-level health promotion interventions usually embody the elements shown in Table 1. These include risk reduction education; efforts to enhance motivation and help the person to develop positive attitudes toward making behavior change; encouraging the individual to perceive personal threat posed by current behavior and to also perceive greater benefits than drawbacks in making behavior change; and strengthening intentions to change behavior and confidence that these efforts can be successful. Often, successfully enacting change in health risk behavior patterns requires the development, practice, and use of skills for implementing change and for handling slips or relapses, which are the rule rather than the exception in most behavior change efforts. Finally, successful interventions to help people change their risky behavior practices provide a lot of ongoing positive reinforcement and support, not only from one's health care provider but from others in one's everyday life. Ignoring someone's efforts to change difficult behaviors is one of the best ways to ensure failure in those efforts.

In clinical care settings, individual or small-group behavioral counseling programs based on these principles are often appropriate, necessary, and feasible. However, solving public health problems also requires the use of "bigger" approaches—beyond the scope of individual or group counseling—that can reduce the prevalence of risk behavior in entire community populations. Such community-level health promotion interventions are also most effective when they are based on sound behavioral science theory. Research on public health risk reduction interventions undertaken at the community level has produced examples of approaches that have worked and also of approaches that have failed. The elements listed in Table 1 have also characterized successful community-level health promotion interventions in areas such as cancer, cardiovascular risk, and HIV risk reduction. As is the case for individual counseling programs, effective community-level interventions are those that provide risk reduction education but extend beyond education to also strengthen population members' positive attitudes, motivations, and intentions toward risk reduction. An especially critical element underlying successful community-level public health prevention programs is changing social norms such that avoiding risk behavior is considered an expected and accepted standard within one's own immediate social or peer group. Just as "peer pressure" is often cited as a reason why some people acquire poor health habits, positive and credible peer models can strengthen the norms that help people avoid risky practices.

RISK REDUCTION INTERVENTIONS: SOME EXAMPLES FROM HIV PRIMARY PREVENTION RESEARCH

The Center for AIDS Intervention Research (CAIR) in the Department of Psychiatry and Behavioral Medicine at the Medical College of Wisconsin has, as its primary mission, the development and scientific evaluation of interventions to reduce risk for HIV infection in community populations vulnerable to the disease. CAIR's research has established that even persons at very high risk for contracting HIV infection can be assisted in reducing their risk both through face-to-face counseling interventions and with specialized community-level approaches. In the remainder of this paper, several examples will be used to illustrate the application of behavioral interventions to the problem of AIDS prevention. Although the examples will focus on HIV/AIDS, similar types of interventions can be—and have been—applied to different health-risk problems including smoking, cardiovascular risk, poor diet, substance use, treatment nonadherence, and others.

HIV RISK REDUCTION GROUPS FOR WOMEN SEEN IN HEALTH SERVICE SETTINGS

Although fewer American women than men have been diagnosed with HIV/AIDS, rates of new HIV infections are increasing more rapidly among women than men.[1] This is especially true for disadvantaged, inner-city, and ethnic minority women because HIV infection is more prevalent in areas where they live.

CAIR investigators were interested in whether small-group HIV risk reduction programs could be offered, and would be effective, in health service settings where impoverished women at risk routinely received care. Working collaboratively with health service provider clinic staff, a five-session group HIV prevention program was developed and offered in the clinics to at-risk women. Participants were women who had histories of sexually-transmitted diseases (STDs), unintended pregnancy, multiple sexual partners, or a high-risk sexual partner. The behavioral intervention groups, usually including 8 to 10 women and two female facilitators, met weekly and included activities reflecting all of the components shown at the top of Table 1. For example, women learned about HIV/AIDS risk and risk reduction steps; identified personal, family, and community benefits of making behavior change; problem-solved, practiced, and role-played ways of handling sexual risk pressures and male partner resistance to condom use; established personal behavior change goals; and supported one another's change efforts.

As we have previously reported,[2] the intervention was evaluated using a randomized clinical trial (RCT) design in which clinic patients were assigned to either the HIV prevention program or a comparison health education program not specific to HIV/AIDS. Detailed interviews with all women before and following the intervention revealed that rates of unprotected sex declined by nearly 50% and condom use more than doubled among women who participated in the intervention. The project established that HIV prevention programs can be effective even for highly disadvantaged women, and that these programs can be successfully implemented in community-based health service settings.

COMMUNITY-LEVEL HIV PREVENTION INTERVENTIONS

Gay men in the United States have been harshly affected by AIDS, and still account for about half of new HIV infections.[1] While rates of HIV infection have leveled in large urban epicenter cities, they continue to be high among gay men in smaller cities, probably because of fewer HIV prevention activities in these smaller communities and norms that do not yet strongly enough encourage safer sex.

Over a long period of research, CAIR investigators have developed and rigorously evaluated a model of community-level intervention in which "popular opinion leaders"—ordinary people who happen to be well-liked and popular within their circles of friends—are systematically identified, recruited, trained, and then guided to deliver HIV prevention messages to friends and acquaintances in everyday conversations.[3] This intervention approach is based on the theory that social group norms favoring risk reduction can be strengthened when well-liked peers personally endorse the value of avoiding risk, recommend strategies to others for implementing behavior changes, and emphasize that they are also making—or trying to make—the same changes.

Undertaken in the unconventional but relevant community settings of gay bars in eight US cities, the study evaluating this intervention surveyed nearly 2000 men entering all of the cities' bars before and again 1 year following the point when the intervention was conducted in four cities. In the four comparison cities, traditional AIDS educational materials were kept available. Relative to the comparison city populations, the intervention city populations showed significant and well-maintained reductions in high-risk sexual practices and increased condom use.[3] The project, which has now also been replicated by our team in work with women living in large inner-city housing developments,[4] shows that cadres of popular and well-liked people can be taught and engaged to serve as effective HIV prevention advocates to others in their communities.

SUMMARY

Burdens to our health care systems, and the human misery caused by premature illness and death, can be eased by increasing our efforts in the primary prevention of disease. Behavioral interventions can play a critical role in the reduction of premature deaths due to many types of cancer, heart disease, AIDS , and other illnesses. Behavioral medicine theory and research can help us identify the most successful and cost-effective interventions to promote health risk behavior reduction. As successful approaches are identified, they can then be incorporated into policies that can advance and benefit the public's health.

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School-based/School-linked Health Centers Expanding Points of Access

Earnestine Willis, MD, MPH

ABSTRACT

Health providers and leaders in urban Milwaukee collectively acted to expand school-based health services to children attending Milwaukee Public Schools (MPS). This School-Based/School-Linked Health Centers' (SB/SLHCs) Collaboration was initiated to increase *points of access* for children, primarily to working-poor families, through mobilizing community resources among local leaders and statewide health systems. Systematic steps such as needs assessment, sharing data, seeking funds and prioritization of school-based sites facilitated the establishment of more than 30 additional SB/SLHCs. This has resulted in approximate 700% increase in school-based health care and health promotion services. This collaboration illustrates how communities and health care systems can effectively advocate and impact local services to benefit a population having high social risk factors. As welfare reform efforts evolve, SB/SLHCs have significantly advanced *access* to mainstream health services through effective local collaborations.

INTRODUCTION

Too frequently, children have poor access to health services. This is true even in Wisconsin, despite its low uninsured population rate. Experts document that the depth and duration of poverty for children are strongly associated with poorer health status and high rates of preventable hospitalizations.[8] As in other large cities, many Milwaukee children face high rates of poverty, infant mortality, teen pregnancy and single-parent households. Specifically, Milwaukee Public Schools (MPS) students face childhood hunger, domestic violence, homelessness and limited access to health services.[6] Recognizing that students who are healthy and ready to learn are better able to become productive working citizens, Milwaukee parents, community leaders, legislators and educators determined that preventable health conditions should not compromise children's futures.

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In the early 1970's the first school-based/school-linked health centers (SB/SLHCs) opened in St. Paul, Minnesota and Dallas, Texas high schools[1] to address teenage pregnancy prevention and provide primary care, generating much controversy over the dispensation of birth control on school premises. Nevertheless, SB/SLHCs increased steadily during the 1970's and again in the 1990's, increasing from 350 in the early 1990's to 1157 in 1998.[1-3] Thirty-seven percent are in high schools, 34% in elementary schools, 16% in middle schools and 13% in other schools.[7] Most SB/SLHCs' funds are from the states' revenues with other contributions from private foundations, Maternal and Child Health Block Grants, local governments, and local community health systems; only 5% comes from Medicaid.[4]

For decades, public health nurses provided acute care within MPS. Over the past 10 years, the Milwaukee Health Department has focused resources away from direct health services and toward health consultation, evaluation, planning and assessment.

In 1996, Milwaukee's community leaders embarked on a public/private collaboration to improve health services points of access. Then, MPS had five SB/SLHCs, two sponsored by different community health centers, two by Children's Hospital of Wisconsin/Medical College of Wisconsin (MCW), and one by University of Wisconsin – Milwaukee School of Nursing. MPS administrators and these providers joined together in the Health Resource Center to support existing SB/SLHCs. In 1997, major health systems such as Aurora Healthcare, Children's Health System, St. Mary-Horizon, and Covenant Health Care, along with state and local public health officials, community health leaders, parents and teachers, began exploring the advantages and disadvantages of SB/SLHCs expansion.

The Center for the Advancement of Urban Children (CAUC), established by the Children's Hospital of Wisconsin and MCW to foster community partnerships, facilitated the planning and implementation process of this collaboration. CAUC's faculty assessed the existing health service capacity, analyzed experiences from Baltimore, New York, Phoenix and the state of Florida and facilitated an expansion planning group. Collabo-

Table 1. MPS SB/SLHC Models

Model A	Model B	Model C	Model D
Physician(s)	Nurse Practitioner(s)	Nurse Practitioners	Psychologist
Nurse Practitioner(s)	Public Health Nurse	Community Outreach Worker	Nurse Practitioner
Medical Assistant(s)	Parent Coordinator	Social Worker	Public Health Nurse
	Social Worker	Health Educator	Nursing Student(s)

rators agreed that:

1. Most community members' perspectives equated SB/SLHCs to contraception and that needed modification,
2. All MPS students may utilize SB/SLHCs if parents give their permission, and
3. New SB/SLHCs must supplement, not supplant, existing MPS health services.

MPS adopted two complementary positions. A vision statement that recognizes students must be healthy and have maximal access to quality health and mental health services. A philosophy statement commits MPS to collaborating with the community to coordinate health services through SB/SLHCs with parental permission.

METHOD

CAUC faculty analyzed children's health- and poverty-related data to identify prevalent health conditions and their contribution to school absenteeism, using the following action steps:

1. *Needs Assessment:* Elementary school children account for 60% of MPS students. A 1996 health assessment revealed that elementary school's health needs included routine health screening, acute care (trauma, asthma attacks, dental caries) and family or individual mental health issues (domestic violence, child abuse and neglect).
2. *Community Support:* Parent groups, elected officials, educators, health care providers and insurers were invited to small-group sessions to review the health status and needs of MPS students while soliciting their participation.
3. *Funding Sources:* Collaborators worked with child advocates and municipal and state legislators to identify funding sources to care for uninsured children. Currently, each health care system carries that cost on their budget and envisions that SB/SLHCs are more cost-effective than emergency department visits for similar services. The major health systems continue to negotiate with state officials and managed care organizations to bill SB/SLHCs' services. We collaborated with the state to gain approval of BadgerCare, Wisconsin's Children Health Insurance Program, to maximize MPS students' insurance status.

Table 2. Percentage of SB/SLHCs in MPS compared to National Proportions (1995 and 1998)

Levels	MPS 1995	MPS 1998	SB/SLHCs 1998 National
Elementary	20%	70%	34%
Middle	20%	15%	16%
High	60%	13%	37%
Others	—	2%	13%
SB/SLHCs	100% (n=5)	100% (n=40)	100% (n=1,157)

4. *Sites/Services Selections:* In peer groups of elementary, middle, and high schools, numerical values for health-related need or asset factors were assigned based on their median value calculated for each student group. The four need factors used for each school were enrollees, percentage of free or reduced lunch (children in households at/below 133% and 185% of the Federal Poverty Level- (FPL), estimated percentage of children living under 150% FPL, and students with special health care needs. The four asset factors, based on their hours/ week/school schedules, were health services, public health nurse, social workers and psychologist. Each school's composite need and asset score was calculated and schools were ranked among their peers with the highest priority given to schools ranked highest for health services needs. Based on this analysis, CAUC recommended new MPS health services utilizing available health providers nearest the high need schools.
5. *Designation of Centers Staff:* Sponsoring health systems assessed their abilities to provide services based on available health status data and characteristics of each school's students. SB/SLHCs staffing models differed among sponsoring health systems as described in Table 1.
6. *Parental Consent and Participation:* Each SB/SLHC worked with the school's principal and parent coordinator to inform parents of their right to permit their children to use the SB/SLHCs. Providers committed to communicate with routine medical providers for children with chronic conditions and to ensure continuity of care.

Table 3. MPS Health Centers' Sponsors, Students and Health Services

Health Providers	Number of Schools by Levels	Enrolled Students 1996/1997[1]	Services
Aurora Healthcare	5E, 2M	2,624; 1,541	Acute Care
Carroll/Columbia College of Nursing	1H, 1M	1,396; 56	Acute Care and Health Education
Children's Health System Medical College of Wisconsin	1M/H, 2H, 1M	791 2,839; 184	Acute and Primary Care
Children Hospital of Wisconsin[2]	3E	1,809	Acute Care
Children's Medical Group[3]	13E	7,396	Acute and Primary Care
City Milwaukee Health Department	1E, 2M, 1H	586; 1,867; 1,782	Nursing Care Only
Isaac Coggs Community Health Center	1H	946	Acute and Primary Care
Marquette University College of Nursing	1M/H	791	Health Education
St. Mary's Hospital - Milwaukee	4E	2,307	Acute Care
University Of Wisconsin - Milwaukee	3E	1,664	Acute and Primary Care

E = Elementary; M = Middle; H = High; M/H = Combined Middle and High
[1]Total students across all schools are not additive since two health providers collaborate for different services in two schools, Grand Avenue Middle/High School and Pierce Elementary School.
[2]Children's Hospital of Wisconsin is a subsidiary of Children's Health System
[3]Children's Medical Group is a subsidiary of Children's Health System

7. *Evaluation Plan:* Common process and outcome measures were established for the different SB/SLHCs models. Process measures assess how well the centers enroll students and how well the practitioners work with school staff and parents. Outcomes sought are increased percentage of immunized children, number of children obtaining glasses after diagnosis via vision screening, percentage of families permitting their children to use the SB/SLHCs, decreased illness-related school absenteeism, reduced number of uninsured children, and long term reduction in emergency acute care encounters.

RESULTS

In 1998/1999, MPS enrollment exceeded 101,000, of which 45% were insured through medical assistance, 17% had private insurance and 38% were uninsured.[5] During 1996/1997, 81% of MPS children qualified for free or reduced fee lunches, up from 64% in 1994/1995.[6]

Relying on private and public support from the sponsoring health systems, these expanded SB/SLHCs opened in September 1997. In 1999/2000, children in MPS have 39 school-based centers and one school-linked center, an approximate 700% increase in points of access through SB/SLHCs. Table 2 illustrates MPS' proportional growth in elementary SB/SLHCs and their proportional decline in high schools health services.

MPS enrollment in 1996/1997 suggests approximately 27,202 students have increased points of access to health-related services due to this collaboration as detailed in Table 3.

DISCUSSION

Uninsured children, particularly those with chronic or acute illnesses, may remain untreated until their conditions become serious enough to warrant emergency care or hospitalization, accounting for millions of dollars in preventable expenditures in Milwaukee. SB/SLHCs have effectively decreased access barriers, i.e. lack of transportation, health insurance, primary care, etc.[1] In general, parents and community members consider schools essential health care sites where they are comfortable allowing their children to see health professionals. SB/SLHCs can also be essential connectors to integrate services into schools and other sectors via outreach or insurance plans.

MPS is strongly committed to comprehensive school health including preventive and acute care, health education and promotion and health careers encouragement. We recognized that community partnerships, provision of population specific health service, sustained funding and evaluation are critical to establishing school health services. Despite outreach to Medicaid-or BadgerCare-eligible families, significant numbers of children remain uninsured. SB/SLHCs play a vital role in outreach, increasing points of access for health care and serving as a mainstream safety-net health provider.

The MPS experience demonstrates how building strong collaborations benefits at-risk populations. In 1995, all but five of 160 MPS schools had no school nurse. With more poor parents working during regular clinic hours, local health and community leaders implemented a model in MPS that increases health services to children.

To determine if SB/SLHC provide quality health

care, we must formulate appropriate health indicators and identify a control group to compare with the intervention group. This poses a challenge because 35-40% of students shift from school to school annually. MPS plans for schools to become more neighborhood-based allowing for more rigorous designs to assess the impact of SB/SLHC models on students' health and points of access. This model is flexible and progressive to permit all health providers to participate in increasing health services accessibility to a large group of vulnerable children.

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Public Health: A Successful Paradigm Applied to Firearm Injuries

Richard L. Withers, JD, James A. Mercy, PhD, and Stephen W. Hargarten, MD, MPH

ABSTRACT

Firearm injuries are a major contributor to injury mortality and morbidity in the United States and account for substantial loss of productive years of life. A public health approach to injury reduction, and particularly firearm injury prevention, has promise because it emphasizes prevention rather than reaction, it utilizes a scientific approach to policies and programs, it brings an integrative, multi-disciplinary approach to the effort, and it emphasizes the role of communities in solving health problems. The new Firearm Injury Center at the Medical College of Wisconsin exemplifies the public health approach to this vexing problem.

INTRODUCTION

Over the last century life expectancy in the United States has nearly doubled. This is largely due to efforts in public health and sanitation to reduce the incidence of serious infectious disease.[1] In recent years the public health model, and its comprehensive community approach to reducing disease, has been applied to reduce injury morbidity and mortality. Injury accounts for greater years of potential life lost before age 75 in the United States than from any other disease.[2]

A new center at the Medical College of Wisconsin (MCW) has adopted the public health approach to reducing firearm injuries. These injuries are a major contributor to injury mortality and morbidity. In the United States each year, 30,000 persons are killed by firearms. Over half of these deaths are suicides. A small percentage of cases are unintentional. In Wisconsin, two-thirds of the 420 or more firearm fatalities experienced annually are suicide, less than one-third are homicide. Violence to oneself or others is complex; a compartmentalized response – focusing only on crime control or mental health interventions – is simply not sufficient to effectively address the problem.

Since its inception two years ago, the Firearm Injury Center at MCW has established a national presence as a leader in firearm injury research. Recently, the Center presented the results of six studies at the annual meetings of the American Public Health Association and the American Society of Criminology. These studies addressed a wide range of timely issues and questions. Studies with major policy implications included an analysis of murder-suicide events, an evaluation of the effect of the assault weapons ban of 1994 on homicides in Milwaukee, a comparison of firearms obtained in gun 'buy-back' programs with those used in fatal events, an analysis of firearm tracing data, and an analysis of state laws across the nation that require physicians to report gunshot wounds to law enforcement authorities. Policymakers, interested in effective responses to recent firearm tragedies, have been particularly interested in evaluations of gun buy-back programs and assault weapons regulation.

THE PUBLIC HEALTH APPROACH

The question arises in polite company and otherwise, "what is this public health approach to violent injury prevention and how can it work to reduce firearm injuries?"

First and most importantly, public health brings an emphasis and commitment to identifying policies and programs aimed at preventing violent injury. The predominant response to firearm violence has been reactive. Overwhelming attention and resources in American society and throughout the world have been given to the deterrence and incapacitation of violent offenders by way of apprehension, arrest, adjudication, and incarceration through criminal justice systems and by treatment of depression and other psychological illnesses contributing to suicide through mental health systems. Little attention, however, has been given to the development and implementation of strategies aimed at preventing violent behavior and its associated injuries from occurring in the first place. A public health perspective shifts the way communities deal with

The Firearm Injury Center of the Department of Emergency Medicine at the Medical College of Wisconsin (MCW), founded in 1997, is dedicated to the reduction of firearm injuries and deaths. Doctor Hargarten is the Center's director and also serves as chairman for MCW's Department of Emergency Medicine. Mr. Withers is the Center's co-director and has extensive experience in public health policy development and analysis at state and national levels. Doctor Mercy is a visiting associate professor in MCW's Department of Emergency Medicine and is a member of the Center.

violence from approaches that respond after the harm is done to strategies of social and environmental interventions to prevent the injury.[3] The Firearm Injury Center applies this principle to firearm injuries by collecting data on and undertaking analyses of the role that the design of firearms may play in causing injury. This research will ultimately play a role in improving our understanding of how firearms can be made safer through changes in design. Similar strategies have worked to modify automobiles and reduce injuries and deaths in car crashes.

Second, the development and implementation of effective policies and programs for preventing violence must be firmly grounded in science. Scientific research provides information essential to developing effective public policies and programs and methods for testing program effectiveness. Public health brings something that has been missing from this field: a multidisciplinary scientific approach that is directed explicitly toward identifying effective approaches to prevention. This multi-disciplinary approach is exemplified by the Wisconsin Model Firearm Injury Reporting System (FIRS) housed at the Center. Drawing from medical examiner and coroner information, law enforcement records and information from the crime laboratory, the FIRS provides a comprehensive picture of the environment, the victim and the agent/vehicle of the disease, in this case, the firearm injury.

The FIRS has now expanded to firearm tracing information from the Federal Bureau of Alcohol, Tobacco and Firearms (ATF) and criminal background information from the Wisconsin Justice Department. The Center leads a consortium of new statewide projects across the country with the goal of establishing a national firearm fatality reporting system. The Fatality Analysis Reporting System (FARS) for car crashes serves as a good model for a national system of injury reporting for firearms based on local and state reporting mechanisms. Such a system can have significant policy implications.

Third, public health brings a tradition of integrative leadership by which a broad array of scientific disciplines, agencies, and communities can be organized to work together to solve the problem of violent injuries. This approach is in direct contrast to traditional responses to violence that have been fragmented along disciplinary lines and often narrowly focused in the criminal justice sector. The advisory boards of the Center and the FIRS reflect this multi-disciplined approach and include representatives from health, law enforcement, legal, social work and other sectors of the community including advocates who have been traditional adversaries on firearm issues.

Finally, public health brings a longstanding commitment to supporting and facilitating the central role of communities in solving health problems. Successful community-based health promotion efforts have improved dietary habits, reduced teenage pregnancy rates, and lowered prevalence of smoking among adolescents.[4-6] Local communities and their governments are in direct contact with their citizens and are thus uniquely well placed to identify and solve the problems that affect people's health and the environment. The full participation of communities in violence prevention is critical to engendering a sense of ownership for this problem and its solutions. Public health seeks to empower people and their communities to see violence not as an inevitable consequence of modern life but as a problem that can be understood and changed.

CONCLUSION

The Medical College of Wisconsin – building on its mission to educate, to provide clinical service and to conduct research – incorporates community service as an equal part of this mission by promoting the public health model to address vexing and complex community health issues such as firearm violence. It is not an easy approach, but the benefits to individual health and the health of Wisconsin communities can be substantial.

(Note: The second Annual Statistical Report of the Firearm Injury Reporting System is now available at the Center's web site at www.mcw.edu/fic.)

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Native American Infant Mortality in Wisconsin

Dawn McCusker, MS, MPH, Holly Clifton, MPH, Nancy Miller-Korth, MSN

ABSTRACT

An infant mortality rate is an important public health measure because it may indicate unmet health needs or unfavorable environmental factors. The infant mortality rate for Native Americans in Wisconsin has decreased over the past several years, although there remains a discrepancy between Native Americans, all races combined and the Healthy People 2000 goal. The Wisconsin American Indian Infant Mortality Review Project (WAIIMR) conducted a study to understand local underlying factors that contributed to infant deaths and to recommend local health initiatives that could be developed to have a positive impact on the health of infants and mothers. The results from the WAIIMR Project and more recent Wisconsin birth record data are discussed in this paper. Two risk factors, levels of prenatal care and maternal smoking during pregnancy, show discrepancies between races and warrant further investigation. Native American communities in Wisconsin are addressing risk factors affecting maternal and child health through projects such as Honoring Our Children and The Michigan/ Wisconsin Epidemiology Center.

INTRODUCTION

An infant's death is a profound occurrence within a family or community. It raises questions about a host of complex, interacting factors such as socioeconomic conditions and health status of the mother (before and during pregnancy) and unmet needs such as preventive care and accessibility of care to the mother and infant. During the years 1983 to 1987, it was noted that while the infant mortality rate for "all races" (this includes all races combined) in Wisconsin was 9.3/1000, the infant mortality rate for Native American infants was 20.7/ 1000.[1]

Traditionally, the infant mortality rate is significant in public health. A high rate is taken to reflect unmet health needs and unfavorable environmental factors.[2] The infant mortality rate is the number of infant deaths divided by the number of live births (usually the rate is per 1000 live births). The infant mortality rate for Native Americans in Wisconsin has decreased over the past several years. This decrease is an important accomplishment for Native American communities and the social and health programs that serve them. It is difficult to pinpoint any one factor causing the decrease in Native American infant mortality, however, there are likely many contributing factors. Health care facilities on reservations are constantly growing and providing more comprehensive services. In addition, living conditions on reservations as well as economic opportunities have improved. Prenatal care coordination programs also exist in most of the tribal communities in Wisconsin. These programs provide prenatal care, education, outreach, assistance with transportation, and access to needed care for mothers and children. However, even with these advances in services and a decrease in infant mortality, the Native American infant mortality rate still exceeds that of all races and the Healthy People 2000 goal.

METHODS

An interagency work group was established to study why the disparity between Native Americans' and all races' infant mortality rates existed. In 1995, Great Lakes Inter-Tribal Council received funding from the state of Wisconsin, March of Dimes, and Indian Health Service for the Wisconsin American Indian Infant Mortality Review Project (WAIIMR).[3] WAIIMR reviewed 92 American Indian infant deaths that occurred during the years 1987 to 1993 to try to understand local underlying factors that contributed to infant deaths and to recommend local health initiatives that could be developed to have a positive impact on the health of infants and mothers. It was felt that this would ultimately improve infant survival. A case-level, community- based infant mortality review protocol was developed and used to examine each of the 92 deaths. WAIIMR results and more recent Wisconsin birth record files are reviewed in the following sections.

RESULTS AND DISCUSSION

Five-year overlapping time periods examined in the WAIIMR project, with the addition of current data,

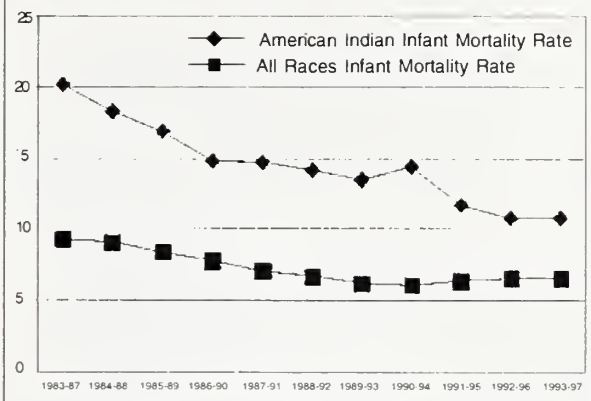
Authors are with the EpiCenter at Great Laked Inter-Tribal Council, Inc. The EpiCenter is a regional epidemiology project funded through Indian Health Service, providing services to tribes in Minnesota, Michigan and Wisconsin.

Table 1. American Indian and All Races Infant Mortality, Wisconsin Five Year Moving Average Rates, 1983-1997 by Race of Mother

Years	American Indian Infant Morality Rate	All Races Infant Mortality Rate*
1983-1987	20.2	9.3
1984-1988	18.3	9.1
1985-1989	16.9	8.4
1986-1990	14.8	7.8
1987-1991	14.7	7.1
1988-1992	14.2	6.7
1989-1993	13.5	6.2
1990-1994	14.4	6.1
1991-1995	11.7	6.4
1992-1996	10.8	6.6
1993-1997	10.8	6.6

*Number of residents per 1000 live birth
Source: Wisconsin Resident Birth and Death Certificates, Bureau of Health Information, DHFS

Figure 1. American Indian and All Races Infant Mortality, Wisconsin Five Year Moving Average Rates (per 1000 live births), 1983 to 1997 by Race of Mother



Source: Wisconsin Resident Birth and Death Certificates, Bureau of Health Information, DHFS

show a decline in Native American infant mortality rates from 1983 to 1997. Table 1 and Figure 1 show the Native American infant mortality in Wisconsin in five-year overlapping periods from 1983 to 1997. Overall, the infant mortality rate has decreased from 20.2/1000 live births in 1983 to 1987 to 10.8/1000 live births in 1993 to 1997. In comparison, the infant mortality rates for all races in Wisconsin have also decreased over time. However, there is a disparity between the all races and Native American infant mortality rates. The 1993 to 1997 infant mortality rate for Native Americans was 10.8, while it was 6.6 for all races.

To address this disparity, risk factors associated with infant mortality must be assessed. Two risk factors which will be discussed here (for which there are also disparities between Native Americans and all races) are levels of prenatal care and maternal smoking during pregnancy.

Numerous studies have shown that prenatal care during the first trimester of pregnancy is associated with reduced rates of infant mortality.[4] Over the past few years, the proportion of Native Americans receiving prenatal care during the first trimester has improved slightly from 65% in 1995 to 68% in 1997. In comparison, first trimester prenatal care for women of all races has also improved slightly, from 83% in 1995 to 84% in 1997.[5] There is an obvious disparity between the proportion of Native American women and all races receiving early prenatal care. Both the Native American population and all races need to improve first trimester prenatal care to reach the Healthy People 2000 goal of 90%.

Native American women receiving late or no prenatal care is consistently about three times that for all races, although it has been decreasing over the past three years from 9.8% in 1995 to 8.7% in 1997 . There is a need for increased outreach and education to Native American women early in their pregnancy or prior to conception to improve the proportion of women receiving prenatal care early. Care at an earlier stage of pregnancy gives a care provider more opportunity for early health and social assessment as well as earlier opportunities for education.

Maternal smoking is another important risk factor that may impact infant mortality. Maternal smoking during pregnancy has been related in previous studies to Sudden Infant Death Syndrome (SIDS).[6] In 1997, about 44% of Native American women in Wisconsin smoked during pregnancy compared to only 18% for women of all races.[5] The WAIIMR Project found that 27.2% of Native American infants dying in the studied time period (1987-1993) died from SIDS compared to only 19.5% for all races in Wisconsin.[3] There may be a relationship between maternal smoking and SIDS, but the extent of that relationship is difficult to determine due to the limitations of infant death records reviewed in the WAIIMR project. Maternal smoking during pregnancy, environmental smoke exposure and their link to childhood illnesses such as otitis media, asthma, and allergies are also of interest in tribal communities. Further understanding the connection between these issues would allow tribal communities to better target prevention efforts, and with successful prevention, would decrease health care costs associated with common childhood illnesses.

CONCLUSION

The WAIIMR Project examination of SIDS deaths noted a limitation in death record documentation. It

found "sleeping arrangements inadequately described in coroner and autopsy reports." Therefore, it is difficult to interpret risk factor data from the WAIIMR project.

Native American communities in Wisconsin are addressing many risk factors affecting maternal and child health that could ultimately affect the overall infant mortality and the health of mothers and their children. There are prenatal care coordination and rural infant health programs in many tribal communities which provide comprehensive case management services to pregnant women and children. Additionally, a Healthy Start project "Honoring Our Children" has been designed to work specifically with Native American families and communities to reduce the infant mortality rate.

Another way tribes in Wisconsin are addressing this health disparity and others is through the Michigan/ Wisconsin Cooperative Epidemiology Project, the "EpiCenter" which was initiated to assist tribal health programs in Michigan and Wisconsin with the development of public health infrastructure. Activities have included the development of surveillance for disease conditions; epidemiologic analysis, interpretation, and dissemination of surveillance data; development and implementation of epidemiologic studies and disease control/prevention programs; and coordination of activities with other public health agencies in the region. Collaborative efforts among tribal, local, state, and federal authorities and universities are promoted and enhanced through the EpiCenter initiative. The EpiCenter works with these projects and Native American communities in Wisconsin to better understand the issues associated with infant mortality and morbidity and to improve the overall health of the communities.

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Six Years in the Making: OIG Publishes 8 New Anti-Kickback Safe Harbors

By Alyce C. Katayama, JD; Ralph V. Topinka, JD; Michael A. Levey, JD; Sheila M. Reynolds, JD; Leonard S. Shifflett, JD; Sarah E. Coyne, JD; Michelle L. Head, JD

After six years of work, the Department of Health and Human Services' Office of Inspector General (OIG) has published final regulations, effective immediately, establishing eight new safe harbors under the federal Anti-Kickback Statute.[1] They cover ambulatory surgical centers, investments in underserved areas, obstetrical malpractice insurance subsidies, practitioner recruitment, investment interests in group practices, referral agreements for specialty services, sales of practices in underserved areas and cooperative hospital service organizations.

OIG also issued two new interim final safe harbors implementing exceptions to the Anti-Kickback Statute for certain shared risk arrangements.

The Anti-Kickback Statute

Enacted in 1972, the Anti-Kickback Statute[3] (fraud and abuse law) forbids those working in the health care industry from knowingly and willfully offering or soliciting, receiving or paying anything of value to influence the referral of patients for items or services for which federal health care programs may be billed. Violations are felonies and are subject to five years in prison, $50,000 in civil fines, $25,000 in criminal fines and lengthy exclusion from participation in federal health care programs. Because this statute is so broad, Congress authorized the OIG to develop "safe harbor" provisions—descriptions of arrangements exempted from the prohibitions. The original provisions, published in 1991, covered space and equipment rental, personal service and management contracts, the sale of retiring physicians' practices to other physicians, referral services, warranties, discounts, compensation of employees, group purchasing organizations and the waiver of Medicare part A inpatient cost sharing amounts. The clarifications to these safe harbors, which are beyond the scope of this article, deal with investment interests, space and equipment rental, personal servies and management contrats, discounts and sale of practice.[4]

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Outside the Safe Harbors

Arrangements that do not fit within a safe harbor are not automatically suspect under the Anti-Kickback Statute. Because the statute is so broad, OIG recognizes that it may technically cover some relatively innocuous commercial arrangments. An arrangement outside the safe harbors will be analyzed against the elements of the statute: whether there is solicitation, offer, payment or receipt of remuneration or economic benefit in exchange for or to induce a referral or recommendation for items or services which are paid for in whole or in part by a federal health care program.

Additionally, OIG's commentary affirms that an arrangement which passes muster under the federal anti self-referral law (Stark Law) may still violate the anti-kickback law.

The New Safe Harbors

Physician Recruitment

The new practitioner recruitment safe harbor permits communities to offer inducements to attract needed medical professionals.

This permits financial incentives for physicians who have been practicing within their current specialty for less than one year to locate in a shortage area. It also may be used to induce any other practitioners to relocate their primary place of practice into a federally designated health professions shortage area ("HPSA") for their specialty as long as all of these standards are met:

1. The arrangement is in writing;
2. If a practitioner is leaving an established practice, at least 75% of the revenues of the new practice must be generated from new patients not previously seen by the practitioner at his former practice;
3. The benefits may not be provided by the entity for more than three years;
4. The practitioner must not be required to make referrals to the entity;
5. The practitioner must not be restricted from establishing staff privileges at or referring services to any other entity;
6. The benefits provided by the entity may not be based on the volume or value of expected referrals;

7. The practitioner may not discriminate against patients receiving assistance under any federal health care program;
8. At least 75% of the revenues of the new practice must be generated from patients residing in a HPSA or a Medically Underserved Area (MUA) or who are part of a Medically Underserved Population (MUP);[4] and
9. The payment may not directly or indirectly benefit any person (other than the practitioner being recruited) or entity in a position to make or influence referrals to the entity providing the recruitment payments.

This safe harbor is limited to "primary care" physicians, defined under federal law as general practitioners, family practitioners, internists, pediatricians, and obstetrician/gynecologists.

Sale of Practice

The existing sale of practice safe harbor has been expanded to sales of physician practices located in rural and urban underserved areas. It applies to practice sales that meet the following requirements:

1. The period from the date of the first agreement to the completion of the sale is not more than three years;
2. After the sale, the physician selling the practice is not in a position to make or influence referrals to, or otherwise generate business for, the purchasing hospital or entity, for which payment may be made in whole or in part under Medicare or a state health care program;
3. The practice being acquired is located in an HPSA for the practitioner's specialty; and
4. From the first agreement pertaining to the sale, the purchasing entity diligently and in good faith engages in commercially reasonable recruitment activities that: (a) may reasonably be expected to result in the recruitment of a new practitioner to take over the acquired practice within a one year period; and (b) will satisfy the conditions of the practitioner recruitment safe harbor.

Investment Interests in Underserved Areas

OIG has recognized that entities in rural areas often find it difficult to comply with the so-called 60-40 tests set forth in the small entity investment safe harbor. In underserved areas, physicians may be the primary source of capital, and physicians in such areas may also have no alternative facility to which to refer patients.

This safe harbor is available in all geographic areas designated as HPSAs or MUAs or as having an MUP.

Three types of entities are eligible: primary care facilities (including general pediatrics, ob/gyn, and internal medicine practices); mental health facilities; and dental facilities. In addition to the long standing requirements for safe harbored small entity investment interests, the following unique requirements must be met for an entity in an underserved area to fall within this safe harbor:

1. No more than 50 percent of the investment interests of each class of investments may be held in the previous year or the previous 12-month period by suspect investors.[5] This requirement replaces the 40 percent limit applicable outside of underserved areas.
2. At least 75 percent of the dollar volume of the entity's business must be derived from service to persons who reside in an MUA or are members of an MUP. This requirement, decreased from 85 percent in the proposed rules, is intended to reduce the likelihood of sham arrangements in which an entity is set up in an underserved area, but its patients come primarily from outside that area.

The OIG has eliminated any variation of the 60-40 revenue test found in the small entity investment safe harbor.

If an area ceases to be underserved, a grace period is granted. This grace period is intended to allow time for the investing entity to restructure itself to meet the requirements or to secure an opinion from the OIG. If the entity can do neither of these things, it will no longer be safe harbored, but does not necessarily become unlawful.

Obstetrical Malpractice Insurance Subsidies

This safe harbor aims to assist federal health care beneficiaries who live in primary care HPSAs in accessing obstetrical services. It carves out of the anti-kickback statute malpractice insurance subsidies for physicians in those areas who practice primarily obstetrics. The rules allow a hospital or other entity to pay all or part of the malpractice insurance premiums for such practitioners, including certified nurse midwives. This applies only to the provision of malpractice insurance regulated by state law. Under these regulations, federal health care programs may not pay hospitals or other institutional providers for costs incurred in providing malpractice insurance.

Investment Interests in Group Practices

Because the anti-kickback statute is broad enough to implicate payments from a traditional, bona fide group practice to its members, this safe harbor is for investment interests in group practices. Prohibited payment does not include return on a solo or group practitioner's investment in the practice itself (as opposed to separately owned health care services) if four requirements are met:

1. The ownership interests are all held by licensed healthcare practitioners who work in the practice.
2. Ownership interests are in the group practice as a whole, not merely in a subdivision of it.
3. A group practice meets the definition of that term in the Stark Law;[6] and the practice is a

unified business with centralized decision making, pooling of expenses and revenues, with satellite offices not treated as substantially separate enterprises.

4. Profit distributions derived from ancillary services, if any, provided by the group are protected only if they meet the "in office ancillary services" exception in Stark Law.

Ambulatory Surgery Centers
The new safe harbors provide protection for four categories of ambulatory surgery centers (ASCs): surgeon owned ASCs, single specialty ASCs, multi-specialty ASCs, and hospital/physician ASCs.

Three requirements must be met by all ASCs seeking safe harbor status. First, the ASC must apply for and obtain Medicare certification. Second, its operating and recovery room space must be dedicated exclusively to the ASC. Third, patients referred to the ASC by an investor must be fully informed of the investor's financial interest in the ASC.

In addition to these standards, the ASC must meet the requirements of one of the four categories.

Surgeon-Owned ASCs. All of the investors of surgeon-owned ASCs must be a) general or specialty surgeons in a position to refer patients directly to the ASC and operate on them; b) surgical group practices composed exclusively of such surgeons; or c) investors not employed by the ASC or any other investor and not in a position to provide items or services to the ASC or to make or influence direct or indirect referrals to the ASC or its investors.

In addition, six standards must be met:

1. the terms of the investment interest in the ASC may not be related to the previous or expected volume of referrals, services or business generated from an investor to the ASC;
2. at least one-third of each surgeon investor's annual medical practice income from all sources must be derived from the surgeon's performance of surgical procedures that could be performed in an ASC;
3. neither the ASC nor any investor may loan funds to or guarantee a loan for an investor to obtain the investment interest in the ASC;
4. payment to an investor in return for the investment must be directly proportional to the amount of the capital invested;
5. all ancillary services for Medicare patients performed at the entity must be an integral part of the ASC procedure, and may not be separately billed to Medicare or other federal health care programs;
6. the ASC and all of its surgeon investors must not discriminate against patients receiving medical benefits or assistance under any federal health care program.

Single Specialty ASCs. These rules are virtually identical to those for Surgeon-Owned ASCs. The difference is that they provide an opportunity to protect ASC investments where the physician investors are not surgeons but are engaged in the same medical practice specialty. While the physicians need not be traditional surgeons, they must perform ASC procedures as a significant part of their medical practices.

Multi Speciality ASCs. This category is similar to the first two but allows a mix of physician investors to include surgeons and procedure-performing non-surgeons. Physician investors in a Multi Speciality ASC must meet all of the requirements described above for Surgeon-Owned ASCs, including the requirement that each investor derive one-third of his practice income from ASC procedures. In addition, each physician investor must meet a second standard related to practice income designed to reduce the risk of referrals among physicians with different specialities. The additional test requires that at least one-third of the procedures performed by each physician investor on an annual basis be performed at the ASC.

Hospital/Physician ASCs. To meet this safe harbor, at least one investor in the ASC must be a hospital, and all of the remaining investors must meet the requirements for investors described above. Eight additional standards must also be met:

1. the terms on which the investment interest is offered may not be related to the previous or expected volume of referrals, services or business otherwise generated from an investor to the ASC;
2. neither the ASC nor any investor may loan funds or guarantee a loan for an investor to buy into the ASC;
3. the payment to an investor must be directly proportional to the amount of capital invested;
4. the ASC and each investor must not discriminate against patients receiving medical benefits or assistance under any federal health care program;
5. all ancillary services performed by the ASC must be directly related to the ASC surgical procedures and may not be separately billed to any federal health care program;
6. any space, equipment or services provided by the hospital to the ASC must be provided in accordance with an agreement that complies with the space rental, equipment rental or personal services and management contract safe harbors;
7. the hospital may not include any costs associated with the ASC on its cost report or on any claim for payment from a federal health care program;
8. the hospital may not be in a position to make or influence referrals directly or indirectly to any investor or the ASC. Comments to the new rules suggest that a hospital could be in a

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Instructions to Authors

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- The conference brochure should accompany the report. It will not be published.

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OIG Publishes 8 New Anti-Kickback Safe Harbors

continued from page 56

position to influence referrals if it employed physicians who made referrals, if it owned surgical practices, or if it was affiliated with a professional corporation owned or controlled by hospital employees.

Referral Arrangements for Specialty Services

This safe harbor, like the one for investment in a group practice, deals with traditional arrangements among physicians that were not considered improper or unethical until the anti-kickback law was enacted. Typically physicians have referred patients to colleagues when medically appropriate with no expectation of payment, but with the understanding that the patient will be "referred back" when the purpose of the referral is concluded.

OIG still has some discomfort with these arrangements and specifically excludes situations where the referring physician and the receiving physician split a global fee. The example provided by OIG is that of an ophthalmologist and an optometrist agreeing to an 80/20 split of the Medicare cataract surgery fee. In such a case, the optometrist conditions his referral to the ophthalmologist on a return of the patient to him for post surgical care, whether or not clinically appropriate.

OIG's concern about those arrangements does not mean that splitting a global fee is always illegal. Such arrangements will not be exempted, but must be reviewed on a case by case basis.

OUTLOOK

Due to the breadth of the anti-kickback statute and the current availability of an advisory opinion program, OIG encourages health care providers to seek opinions when there is not a safe harbor available to them. This is interesting since OIG and HHS resisted enacting an advisory opinion process for many years. Although the process under current law will sunset in August of 2000, there are already proposals pending in Congress to extend its life.

Despite the fact that it took six years for eight new safe harbors to go from proposed to final form, OIG promises that it will issue additional safe harbors periodically. In the meantime, medical and legal practitioners alike will continue to struggle in the gray areas within and outside the safe harbors.

ENDNOTES

1. 64 Fed. Reg. 63,518 (November 19, 1999).
2. Obtain a discussion of the original safe harbors and their clarifications by contacting the authors.
3. 42 U.S.C. § 1320a - 7b(b)
4. The MUA and MUP definitions focus on the level of service to an area and take into account factors such as population-to-primary physician ratios, infant mortality rates, poverty rates, and the percentage of the population that is 65 or older.
5. "Suspect investors" are those in a position to make or influence referrals to, generate business for, or furnish services to, the entity.
6. 42 U.S.C. § 1395nn(h)(4).

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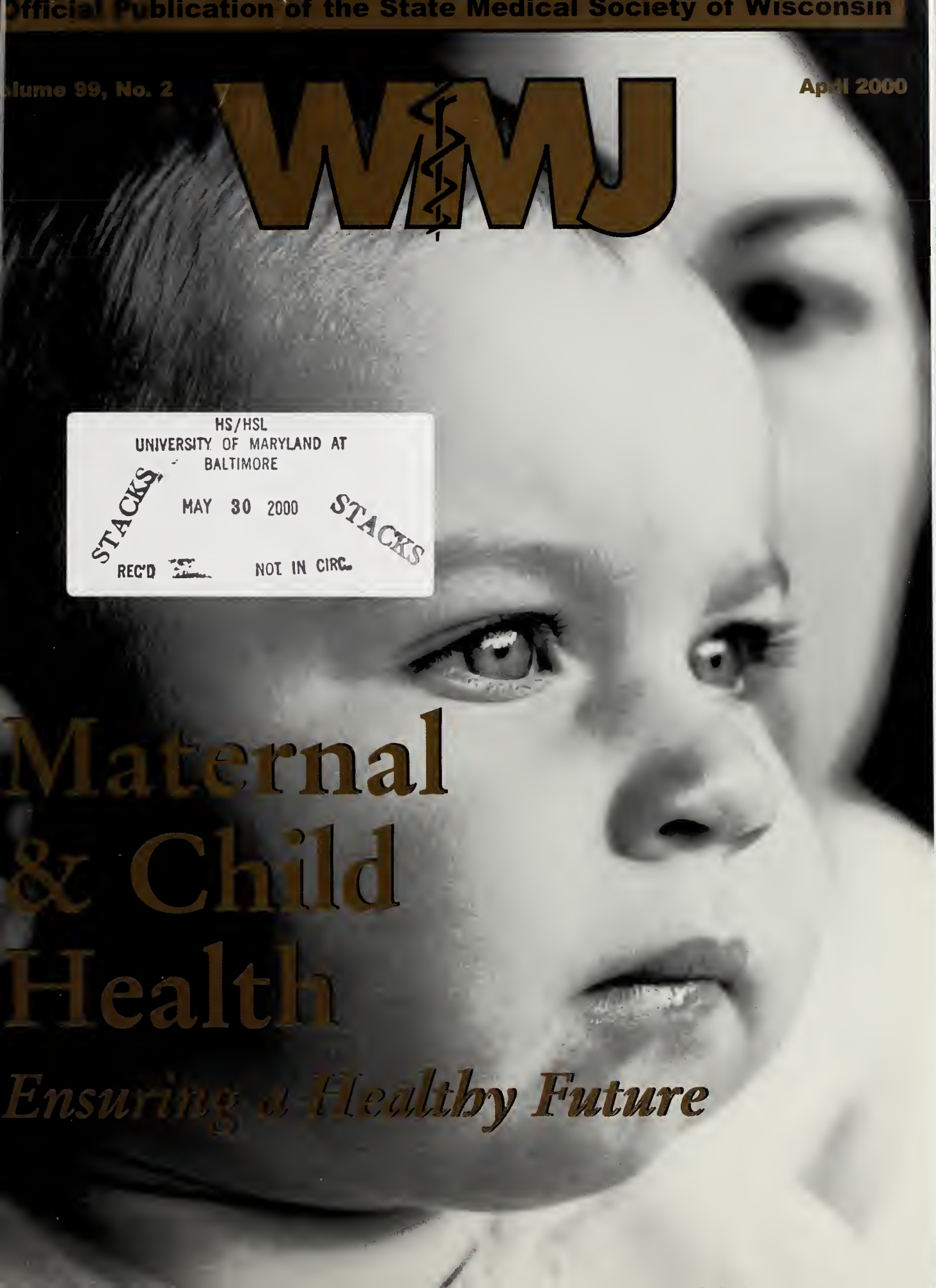

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WMJ's Public Health Series Begins With a Look at MCH

by Thomas C. Meyer, MD, WMJ *Medical Editor*

Many of you will remember the impressive report entitled "Healthier People in Wisconsin 2000" distributed in the early 1990's. It laid out the major public health problems in the state along with a series of laudable objectives for the health community to aim for by the year 2000. While it is sad that there was no state budgetary appropriation to coincide with the report, the *WMJ* Editorial Board agreed that it would be of interest to ask our colleagues in the Wisconsin Division of Public Health to take leadership in reviewing progress that has been made towards those objectives. We recognized that there are over 200 objectives in the Healthier People document and asked that they select those of greatest interest to them and, hopefully, to *WMJ* readers. These reports start in this issue with the theme being centered around maternal and child health.

We were pleased to persuade John Chapin, Administrator, Division of Public Health, to provide guest editorials for each of the five issues of *WMJ* that examines public health. He has agreed to discuss the socio-political aspects of health policy in Wisconsin and educate us in the realities of what can and cannot be done with and without cooperation between the practicing and public health sectors in the state.

The overview of the progress in the area of maternal and child health is provided by Richard Aronson MD, MPH, (p. 18) who reviews the five principles by which the Family and Community Health section of the Division seeks to enhance the health and safety of the state's children and families. Doctor Aronson draws our attention to the problem of African American infant mortality — a topic expanded upon in Dr. Kvale *et al's* article (p. 52), which points out that there have been significant declines in the white infant mortality rate over the last 10 years but no change in the African American infant mortality rate. On the other hand, Dr. Aronson outlines the success of the Special Supplementary Nutrition Program for Women, Infants and Children (WIC) and asks that we refer appropriate patients to the program and consider speaking out with the assistance of lecture notes and slides obtainable from the Children's Health Alliance of Wisconsin. Dale Tavris, MD, MPH, and his colleagues outline the apparent success that the Waukesha County Public Health Department has had in decreasing the reported risk behaviors in pregnancy of a group of their clients (p. 47). While the men- tion of self-reporting raises concern, Dr. Tavris' data is impressive enough to warrant further studies.

Several articles relating to newborns underline the increased emphasis on prevention and early detection in the newborn. Ms. Borke and her colleagues outline the recently-introduced screens by which fatty acid disorders and organic acidemias will be detected prior to the onset of any symptoms or signs (p. 38). She provides little information about the clinical pictures of these obscure disorders, but perhaps she is being kind and allowing us to find out more about any that should come up at the time of abnormalities being reported in the screened samples. Doctor Meurer *et al* reminds us of the 1993 Consensus Conference recommendation that all infants should be screened for hearing impairment—that an estimated 200 babies are born annually in Wisconsin with hearing impairment and that we fall far short of the recommended hospital-based automated brainstem response screening (p. 43). Doctor Pletta and colleagues plead for increased physician support for breastfeeding as a crucial element in women's decisions to breastfeed (p. 55). Doctor Allen's study questions the necessity of a second dose of Ceftriaxone in the group of infants whose "FUO's" are so worrisome (p. 60).

Finally, two papers dealing with women who smoke. Doctor Kvale *et al* points out that although smoking prevalence among Wisconsin women who are pregnant has shown a significant decrease to 18%, this is short of the 10% goal identified in Healthy People 2000 (p. 63). Doctor Fiore and his colleagues describe a successful collaborative effort by the Wisconsin Women's Health Foundation and other agencies in the reported reduction in smoking in a cohort of 19,000 Wisconsin women (p. 68). If the sample the authors used for telephone follow-up is truly representative of the whole group, the authors have good reason to be elated by their success. The green-visored, dyspeptic cynics doubtless will once again question the reliability of self-reports, but it surely sounds a promising approach.

WMJ

Official Publication of the State Medical Society of Wisconsin

COVER THEME MATERNAL & CHILD HEALTH

Children and families today are living in an era of rapid social change. This issue of WMJ, *which is the first in a series of collaborations with the Wisconsin Division of Public Health, explores the impact some of those changes have had on maternal and child health in Wisconsin.*

Cover design by Kendi Parvin, *WMJ* Managing Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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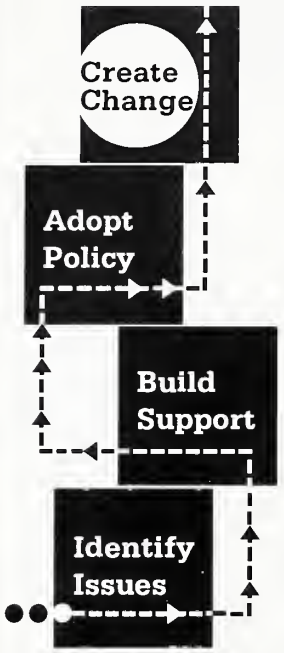
The American Medical Association Organized Medical Staff Section (AMA OMSS) invites your medical staff to be represented at its

2000 Annual Assembly Meeting

June 8-12, in Chicago



The OMSS is a powerful voice, advocate, and resource for empowering hospital and other health care entity medical staffs. The OMSS meets twice year to:

- **Identify issues** of critical importance to medical staffs, such as on-call emergency coverage and EMTALA guidelines, scope of practice, "exclusive credentialing," HCFA regulations, and medical errors;
- **Build support** for these issues through educational programs, special issue forums, state and regional caucuses, reference committee hearings, the OMSS Assembly, and the AMA House of Delegates; and
- Persuade the AMA to **adopt policy** that will further the needs and concerns of medical staffs; so as to
- **Create change** at various levels within the public and private sector in an effort to improve the quality and delivery of medical care and the professional and personal success of physicians

Elect a member of your medical staff to serve as an OMSS representative* and attend the **2000 Annual AMA OMSS Assembly Meeting**. Topics for educational programs include:

- communication basics, team building and problem-solving
- on-call emergency coverage and EMTALA compliance
- scope of practice
- medical staff bylaws and the changing environment
- building "win-win" relationships between medical staffs and hospital/IDS administration
- status of legislative initiatives
- medical errors
- the impact of MCO insolvency on physician practice

For more information on how to register, call 800 262-3211 and ask for the Department of Organized Medical Staff Services or e-mail us at **omss@ama-assn.org**

*Must be an AMA member

American Medical Association

Physicians dedicated to the health of America

Welcome New Members

The individuals listed below were recently elected to SMS membership by their County Medical Societies. We are pleased to welcome them to the SMS.

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Gregory M. Bottei, MD
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David C. Rohde, MD
Pierce M. Sherrill, DO

Clark
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Apple Anna Glaspey (S)
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Jeffrey B. Jensen (S)
Aaron R. Johnson (S)
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Jeremy S. Juern (S)
Murray L. Kapell (S)

Who's in the News

Swati Biswas, MD, a physical medicine specialist with Marshfield Clinic-Wausau, has received the Earl C. Elkins Award, presented by the American Board of Physical Medicine and Rehabilitation.

Richard A. Dart, MD, was recognized by the American Society of Hypertension by being designated as an ASH Specialist in Clinical Hypertension.

Theodore Fox, MD, and **John McKenna, MD,** Antigo family physicians, were named associate professors of family practice at the University of Wisconsin Medical School.

W. Bruce Fye, MD, a Marshfield Clinic cardiologist, was named the recipient of the 2000 William H. Welch Medal for his outstanding work in authoring a landmark volume tracing the history of American cardiology.

Roger S. Gray, MD, a family physician from Eau Claire, was honored for 45 years of membership in the American Academy of Family Physicians.

Anthony Hecht, MD, of the New Richmond Clinic, was named the 1999 NCI Catholic Elementary School Distinguished Graduate by the National Catholic Educational Association.

Mahendr S. Kochar, MD, professor of medicine and pharmacology/toxicology at the Medical College of Wisconsin, has been named senior associate dean for graduate medical education.

Barbara Lauderdale, MD, of Neenah's Theda Clark Medical Center, received a Community Service Award from the AIDS Resource Center of Wisconsin at its annual "Have a Heart" fundraiser.

Lawrence Platt, MD, was chosen as surgical instructor of the year by the ophthalmology residents at the Medical College of Wisconsin.

Raj D. Rao, MD, an orthopaedic surgeon in Milwaukee, was inducted as a fellow of the American Academy of Orthopaedic Surgeons during the Academy's 67th annual meeting.

Frank Rubino, MD, a family physician at Family Health Specialists in Wausau, was honored for 20 years of membership in the American Academy of Family Physicians.

Ryan J. Kehoe (S)
Michelle L. Kerns (S)
Heidi A. Knauf (S)
Eric L. Kroner (S)
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AMA Awards

The SMS member physicians listed below recently earned the AMA's Physician Recognition Award. They have distinguished themselves and their profession by their commitment to continuing education, and the SMS offers them its congratulations.

Maria T. Aristigueta-Merkhofer, MD
Jules H. Blank, MD
Edward J. Coleman, MD
Donna D. Davidoff, MD
Edwin L. Downing, MD
Donald L. Feinsilver, MD
Kenneth Felz, MD
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Robert M. Gerson, MD
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Mark A. Huffman, MD
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Ali A. Mohammad-Zadeh, MD
Rajagopal R. Nandyal, MD
Eugene J. Nordby, MD
Michael J. O'Brien, MD
Frederic L. Paulsen, MD
Stanley E. Peterson, MD
Alfred J. Tector, MD
Paul C. Todd, MD
Michael P. Vrabec, MD
Stephen B. Wilson, MD
Brent M. Wogahn, MD

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Rachel K. Wierzba (S)
Thomas J. Wilkins (S)
John J. Wilson (S)
Siobhan Deire Wilson (S)
Nellie M. Wirsing (S)
Mark J. Wolowick (S)
Steven M. Zeddum (S)
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Jerrad P. Zimmerman (S)
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Eau Claire-Dunn-Pepin
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Julia I. Kyle, MD

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Green
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La Crosse
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Tyson K. Schwiesow, MD
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Ashish Verma, MD

Monroe
Aleksandra Stuparic-Stancic, MD

Oconto
Scott H. Conant, MD

Ozaukee
William M. Lane, DO

Rock
Howard V. Elconin, MD
Vernon S. Partello, III, MD

Shawano
Anna L. Alquiza, MD

Sheboygan
Renee A. Staehling, MD

Walworth
Gerald Fleer, MD

Waukesha
James M. Chapman, MD
Mark A. Dorow, MD
Steven J. Kream, MD
Susan J. Layeux, MD
David M. Letzer, DO
Karin L. Mulrooney, MD
Kari A. Oliver, MD
John M. Ostergaard, MD
Mary J. Rolfes-Lo, MD
Thomas J. Sheedy, MD
Mary A. Sonsalla, MD
Gary L. Swart, MD

Wood
Brent P. Fletcher, MD
Jean Charles Montgomery, MD

(S) designates medical student membership

In Remembrance

Bachhuber, Edward A., MD, 87, of Mayville, passed away January 8, 2000. He earned his medical degree from Harvard Medical School in 1937 and trained in surgery at the Milwaukee County General Hospital and at the University of Pennsylvania.

Doctor Bachhuber served in the US Army during World War II and was commanding officer of a portable surgical hospital and medical group in the Southwest Pacific. He earned two distinguished unit badges, a Bronze Star and a personal commendation from General Douglas MacArthur.

In 1946, Dr. Bachhuber was appointed to the faculty of the Marquette University School of Medicine, where he served in a variety of capacities including assistant dean, associate dean and acting dean. He was a founding member of the Wisconsin Chapter of the American College of Surgeons, also serving as its president. He has been president of the Milwaukee Academy of Surgery, Milwaukee Surgical Society, Milwaukee Academy of Medicine and the Wisconsin Lung Association, and president-elect of the Wisconsin Surgical Society. He was in private practice in Milwaukee for about 30 years while working at the medical college.

Doctor Bachhuber is survived by his wife, Blue Ryan; his children, Patricia Barone, of Fridley, MN, Mary Watts, of Seattle, Liz, of Weimar, Germany, Tim, of Mayville, Tom, of Milwaukee, and Dan, of St. Paul, MN.

Bachhuber, Hugo M., MD, 94, of St. Paul, MN, formerly of Wausau, passed away February 11, 2000. He earned his medical degree from the University of Wisconsin Medical School in 1929 and completed his internship at St. Marys Hospital in Madison. He practiced in Random Lake, and in 1931 he moved his practice to Athens, where he was joined by his brother Gregory in 1940.

Doctor Bachhuber was a Lieutenant Colonel in the US Army Medical Corps during the Korean War. After being discharged, he worked for the State of Wisconsin Department of Health and Social Services at what was then Winnebago State Hospital (now Winnebago Mental Health Center). He semi-retired in 1971 and moved to Wausau where he worked at the Marathon County Health Care Center until full retirement. He was a member of the 1979 SMS 50 Year Club.

Doctor Bachhuber is survived by his children, Nancy Massman and Elizabeth Litke, both of St. Paul, MN, Carl and Bill Bachhuber, both of Portland, OR; seven grandchildren and five great-grandchildren; and his brother, Gregory Bachhuber, MD, of Tomahawk.

Bickford, Robert H., MD, 82, of Stevens Point, passed away February 4, 2000. He earned his medical degree from State University of Iowa, completed his internship at Highland Hospital in Rochester, NY and residency at State Univeristy of Iowa.

Doctor Bickford served as a major in the Army Medical Corps during the Korean War as chief of medicine to the 395th Station Hospital in Nagova, Japan, and was later assigned to the Tokyo Army Hospital in charge of the peripheral vascular section. In 1955 he joined the Rice Clinic where he practiced internal medicine until his retirement in 1980. During his years with the clinic he served on the hospital board, and held many staff positions and initiated programs in intensive care. He was a member of the 1997 SMS 50 Year Club.

Doctor Bickford is survived by his wife, Jane; his children, Dennis (Kathy) in Iola, Nancy of Sierra Vista, AZ, Dr. Janice (Gary) Heikenen in Marshfield, and Thomas in El Paso, TX.

Black, Samuel B., MD, 92, of Fort Lauderdale, FL, passed away February 13, 2000. He earned his medical degree from Marquette University and completed his internship at Milwaukee General Hospital.

Doctor Black practiced for nine years before joining the Army Air Corps where he soon became a flight surgeon with the 15th Air Force in Italy. He returned to the states and completed his psychiatry residency at Milwaukee County Hospital before going into private practice in psychiatry and psychoanalysis in the Milwaukee area.

Doctor Black was co-founder of the Wisconsin Psychoanalytic Society, member of the 1983 SMS 50 Year Club, Life Member of the International Psychoanalytic Association, American Psychoanalytic Association, American Medical Association, State Medical Society and Life Fellow of the American Psychiatric Association.

Doctor Black is survived by his sons, David, of Milwaukee and Michael, of Seattle, WA; five grandchildren and seven great-grandchildren.

Carter, Kenneth L., MD, 87, of Beloit, passed away January 18, 2000. He earned his medical degree from Washington University Medical School in 1938 and served his internship at St. Louis City Hospital, St. Louis, MO.

Doctor Carter served on the surgical staff of various US Army hospitals in the United States and India from 1941 to 1946 during World War II, attaining the rank of Major in the Medical Corps. After

the war, he returned to St. Louis to finish his residency. He came to Beloit in 1947, when he and two other physicians founded the Beloit Clinic. Doctor Carter was a member of the Wisconsin Surgical Society, the Hodgen Surgical Society, a Fellow in the American College of Surgeons, member in the 1988 SMS 50 Year Club, and the medical staff of Beloit Hospital.

Doctor Carter is survived by his wife, Frances; his children, Linda (Dr. John) Spates, of Beloit, Janet (James) Anderson, of Eagan, MN, Jack (Linda), of Delavan; and four grandchildren and one niece.

Halloran, William R., MD, 74, of Milwaukee, passed away December 24, 1999. He served two tours in the US Navy before going on to receive his medical degree from Marquette University in 1961 and serving his internship at St. Mary's Hospital in Milwaukee. He then became one of the first partners at Glendale Clinic. Doctor Halloran served as team physician at Shorewood High School, Shorewood's village health officer and head of the family medicine department at St. Michael's Hospital.

Doctor Halloran is survived by his wife, Cindy; his sons, Mark, of San Bernardino, CA, William, of Mundelein, IL, Paul, of Western Springs, IL, David, of Shorewood, and Jack, of Houston, TX; and nine grandchildren.

Kennedy, Ralph O., MD, 74, of Appleton, passed away February 3, 2000. He earned his medical degree from the University of Wisconsin Medical School, completed his internship at the University of Texas, Galveston, and his residency at the University of Michigan, Ann Arbor. He served in the US Army for two years. He was the founder of Radiology Associates, SC, head of the St. Elizabeth Radiology Department, and a Fellow of the American College of Radiology.

Doctor Kennedy is survived by his wife, Betty; his children, Ralph O. (Linda Dejmek), of Menasha, Linda Kennedy (Steve Lande) of Menasha, Robert P., of Appleton; and his grandchildren, Erika and Kelsey Evenson, of Menasha.

Klabacha, Martin E., MD, 48, of Minocqua, passed away February 4, 2000. He earned his medical degree from Loyola University in Maywood, IL and completed his internship at Indiana University. He did his ear, nose and throat residency at Loyola University in Maywood, IL, and his plastic surgery residency at the University of Oregon in Portland. He practiced in the Lakeland area for 14 years at Lakeland Medical Associates, Howard Young Medical Center, Marshfield Clinic, Rhinelander Medical Center and St. Mary's Hospital.

Doctor Klabacha is survived by his wife, Peggy; his children, Thaddeus, Jonathan, Kristen; one brother, Paul, of Lemont, IL, and sisters, Barbara, Rosemary and Karen, all of Chicago.

Landmann, Gustave A., MD, 78, of Tomah, passed away January 28, 2000. He served in the US Navy during World War II, attaining the rank of lieutenant. He went to medical school for two years in South Dakota and finished his degree at Marquette Medical School in 1951. He came to Tomah in 1951 and went into partnership with Dr. J.S. Mubarak before merging with the Skemp Clinic. He was also employed by the VA Medical Center in Tomah for three years, and served as Deputy Corner for Monroe County for many years.

Doctor Landmann is survived by his children, Chuck, of Chicago, John (Holly), of Madison, Carolyn (Jerry Shea) Coleman, of Crystal Lake, IL, Susan (Smoke) Pierce, of Tomah; and four grandchildren, Chris Landmann, Mikell Coleman, Michelle and Bryan Pierce.

Lillie, Richard H., MD, 82, of Fox Point, passed away March 5, 2000. After earning his medical degree at Harvard University, he became a captain in the US Army's 82nd and 101st Airborne divisions during World War II and operated in field hospitals in France and at the Battle of the Bulge. After the war, he did his surgical residency at the University of Michigan and established a practice in Milwaukee in 1951. He was on the board of Northwestern Mutual Life Insurance Company, trustee of the Lynde and Harry Bradley Trusts, vice president of the Bradley Foundation, trustee Emeritus of Goodwill Industries, and a member of the 1993 SMS 50 Year Club.

Doctor Lillie is survived by his wife, Jane; and his children, Diane McCallister, of Bryn Mawr, PA, and Richard Jr., of Chicago.

Otterhold, Erland R., MD, 84, of Decorah, IA, passed away February 14, 2000. He earned his medical degree from the University of Wisconsin School of Medicine and internship at the California Hospital in Los Angeles.

After completing his residency in obstetrics and gynecology, Dr. Otterhold became associated with the Pember-Nuzum Clinic (now the Janesville Riverview Clinic) until his retirement in 1983. He was a captain in the US Army Medical Corps, and served one year each at the 98th General Hospital in Munich and the 5th General Hospital in Stuttgart, Germany, where he was Chief of the Obstetrics and Gynecology Section. He was a Fellow of the American College of Surgeons and the American College of Obstetricians and Gynecology, a Diplomate of the American Board of Obstetrics and Gynecology, Life

Member of the State Medical Society and a member of the 1993 SMS 50 Year Club.

Doctor Otterhold is survived by his wife, Thelma; his children, Gary, of Wisconsin Dells, Karen (James) Ehrie, of Decorah, IA; and two granddaughters, Kjersti Ehrie, of Kansas City, MO, and Mari (Greg) Lewey, of Waukon, IA.

Paquette, Louis, J., MD, 85, of Fox Point, passed away February 15, 2000. He earned his medical degree from Marquette University and completed his internship and residency at St. Mary's Hospital, Milwaukee. He served in the US Navy and the US Marine's Medical Corps during World War II in the South Pacific. He established a full-time practice in Milwaukee, assisted in developing St. Mary's OB/GYN residency program, and was a life member of the State Medical Society and a member of its 1992 SMS 50 Year Club.

Doctor Paquette is survived by his wife, Jane; his children, James (Francy) of Menomonee Falls, John (Mary) of Adell, Peter (Carole) of Mauston, and Jane (Noel M.) Noel of Sarasota, FL; and grandchildren, Matthew, Carey, David, Meghan, Michaela, Jane, and Nicholas.

Sautter, Richard D., MD, 73, of Marshfield, passed away January 30, 2000. He served in the US Army during World War II in the Pacific Theater. He earned his medical degree from the University of Nebraska at Omaha and served his internship at Highland Alameda County in Oakland, CA. He later received training in general surgery, served as instructor of general surgery and served his residency in thoracic surgery at the State University of Iowa. In 1961 he joined the medical staff of Marshfield Clinic and started the open heart surgery program there.

Doctor Sautter was a founding member of the Society of Thoracic Surgeons, a Fellow in the American College of Surgeons, Executive Director of Marshfield Medical Research Foundation from 1977 to 1990, and served as Medical Editor of the *Wisconsin Medical Journal* from 1988 to 1995. He was awarded the First Annual Gwen D. Sebold Research Fellowship in 1988.

Doctor Sautter is survived by his children, Daniel R. (Mary) of Eau Claire, Michael G. (Ilisa) of Chili, Mark A., of Eau Claire, and Ann E. Sautter, of Madison; and five grandchildren, Tucker, Rhiannen, Tess, Skylar, and Danielle.

Seefeld, Philip H., MD, 85, of Three Lakes and Mesa, AZ, passed away December 10, 1999. After receiving his medical degree from the University of Wisconsin-Madison (two years) and the University of Pennsylvania Medical School (two years), he held a surgical fellowship at Mayo Clinic. He practiced surgery in Milwaukee from 1945 to 1977.

During his 32 years of practice, Dr. Seefeld served as the chief of surgery for Columbia Hospital and was a member of the Milwaukee Surgical Society, the American College of Surgeons, the American Medical Association, and member of the SMS 1989 50 Year Club.

Doctor Seefeld is survived by his wife, Jeanne; three sons, Philip (Susan), of San Francisco, CA, John (Mary), of Three Lakes and Mark (Gale) of San Diego, CA; and six grandchildren.

Smith, Max M., MD, 80, of Madison, passed away February 10, 2000. He earned his medical degree from the University of Wisconsin Medical School in 1944 and served his internship at the University of Oregon Hospitals and Clinics before serving in the armed forces.

Doctor Smith served as a Regimental Surgeon during World War II in the European Theatre with the US 3rd Army. During that time he was admitted to and graduated from the University of Vienna Medical School, Graduate School of Surgery, Vienna, Austria.

From 1947 to 1950, Dr. Smith took his psychiatric residency at the University of Wisconsin Medical School, serving as Chief Resident before going into private practice in Madison. With other physicians, he founded Madison Psychiatric Associates, a private practice which provided a variety of mental health services.

Doctor Smith served as an officer and board member of Wisconsin Physicians Service, Inc. (WPS) and served as its treasurer prior to his retirement. He served on and was a member of numerous committees and organizations. He was a life member of the American Psychiatric Association, helped to organize the Wisconsin Psychiatric Association, was appointed by Governor Reynolds to the Governor's Mental Health Advisory Committee, was appointed as a Commissioner to the Wisconsin Physicians Service Insurance Commission of the State Medical Society of Wisconsin in 1967, and was member of the 1994 SMS 50 Year Club.

Doctor Smith is survived by his wife, Katherine; his children, Gregory, of McFarland, Stephen, of Madison, Kathleen Voeltner, of Watertown, Patrice, of Phoenix, AZ; 10 grandchildren and a great-grandchild.

Tamayo, Alfonso G., MD, 65, of Sturgeon Bay, passed away January 10, 2000. He earned his medical degree from the University of Santo Tomas Faculty of Medicine and Surgery located at Manila, Philippines. He served a rotating two year internship at the University of Santo Tomas Hospital and St. Anthony Hospital, Louisville, KY. He moved to Sturgeon Bay in

1972 and practiced medicine there until his retirement in 1995.

Doctor Tamayo is survived by his wife, Cornelia; his children, Alfonso Jr., Charmaine, and Mary Anne (Dr. Joel) Brasch; and his grandchildren, Alessandra and Orion Alfonso Tamayo and Hanah, Spencer, Maxwell and Lillian Brasch; adopted grandchildren, Michael and Alex Hamm, and his godson Taylor Goettelman.

Waskow, William L., MD, 90, of Madison, passed away January 30, 2000. He received his medical degree from the University of Wisconsin and then served as a member of the first medical unit of the Air Force during World War II. Following the war, he joined the Jackson Clinic as a radiologist retiring in the early 1970's.

Doctor Waskow is survived by his wife, Margaret; his daughter, Deborah Eckels; and his sister, Dr. Eleanor Waskow.

Wishart, John H., MD, 87, of Eau Claire, passed away January 22, 2000. He received his medical degree from the University of Wisconsin Medical School and completed his internship at Research Hospital, Kansas City, MO, and residency at the University of Minnesota Graduate School and Veterans Administration Hospital, Minneapolis, MN. He served as a flight surgeon in the US Navy for two years.

Doctor Wishart practiced at the Midelfort Clinic from 1948 until his retirement in 1981. He was instrumental in establishing the first Coronary Care Unit in Wisconsin at Luther Hospital, was a member of the American College of Physicians, College of Cardiology, president of the Wisconsin Society of Internal Medicine, member of the Board of Directors of Wisconsin Heart Association, life member of the State Medical Society and a member of the 1988 SMS 50 Year Club.

Doctor Wishart is survived by his wife, Catherine; his daughters, Cathy Seyberth, Olympia, WA, Elizabeth (Richard) Lindholm, Cedar Rapids, IA; grandchildren, Elizabeth, Whitney, Derek and Kirsten.

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Practicing Medicine on Navajo Reservation Proves Eye-Opening and Rewarding

by Carl Chelius, MD

I spent the first 6 months of 1998 in the mountains of eastern Arizona volunteering as a physician in Ganado, located on the Navajo Indian reservation.

About 220,000 Navajo live on the reservation of about 25,000 square miles. It reaches from the Four Corners area to Flagstaff and then east into New Mexico. The "compound" was a turn-of-the-century Presbyterian mission that eventually became Ganado College and Hospital. A new hospital was built in the 1960's and the medical establishment management was turned over to Project Hope in the 70's. Today, it is managed by a Navajo board of directors under the auspices of the Arizona Board of Health. The old hospital is an outpatient clinic, and a surgical suite was added to the new hospital in 1997. The hospital also has an emergency room with two ambulances and is hoping for a CAT scanner. There is a well-staffed dental clinic, an eye clinic, a pharmacy, laboratory, x-ray and ultrasound. There is also a 12-chair dialysis unit managed by out-of-town nephrologists, but the clinic provides any acute care.

The clinic sees about 200 patients a day, slightly less in summer. It has a telemedicine hook-up with the University of Arizona Hospitals in Tucson. It also staffs two outlying field clinics that are hooked up to the internal computer system. The Navajo Health Foundation also has a Social Service Department and community health nurses who visit the elderly, check on meds, give B12 injections and do child-care follow-up. Medical workers and pharmacists at the compound are rather transient, the longest tenure being 5 to 6 years.

Upon arrival, I had "sensitivity training." A colleague told me that the Navajo are proud, initially shy people, who would avoid eye contact. They may or may not keep their appointment at their clinic, and may or may not take their medications. They would come in with yellow corn dust or cedar ashes on their body or in their hair after a ceremony performed by the medicine man. If I wiped that off, for instance to start an IV, it would negate the healing value. They have many taboos and superstitions that should never be threatened as the Navajo believe in curses. They don't mind being called Indians and they call us Anglos.

Thus equipped, I started my office hours. Outside of Ob-Gyn and pediatrics I treated almost anything. I saw 10 to 20 patients per day, ordered labs, x-rays and drugs, EKGs and injections. While I found my colleague's sensitivity lessons fruitful, after awhile, the shy patients who avoided eye contact became very friendly, open and talkative. And they kept their appointments when able, which was not always possible. For example, I scheduled one patient for gallbladder surgery. She did not show up. She came in for the surgery a week later. Her kids had taken her pickup truck, and she had no transportation, no telephone or way to notify us.

Navajo certified nursing assistants (CNAs) weighed patients and took their temperature and blood pressure. These CNAs also acted as interpreters, since as many as 35 to 40% of patients didn't speak English. I got to know only one younger Navajo woman who did not speak the native tongue, and I learned as much as I could, which endeared me to my patients.
I did some consulting in the hospital, gave lectures in ECG and clinical cardiology and attended two weekly meetings to discuss hospital patients. I had no administrative duties, did my charts on an almost daily basis in the record room and was glad that it was like the old days: just practicing medicine.

The family physicians and the physician assistants were very competent. We worked closely and consulted each other. We read our own x-rays. The radiologist came by private plane from Flagstaff every other week and we trucked our films to Flagstaff between his visits for official interpretation. The laboratory often frustrated me and I had difficulties accepting that a test either was not performed or got lost. I finally got over it and learned to work with minimal lab data.

I saw much hypertension, some coronary artery disease and much diabetes, which has increased since the horse and wagon were traded

Editor's Note: Doctor Chelius returned to the reservation in mid January to spend three more months performing medical volunteer work.

in for the pickup truck and the level of exercise has decreased. There is less hunting and walking than in years past and fast food places are springing up in and around the reservation. Most diabetics are orally controlled; some require insulin. I saw no carotid artery or peripheral vascular disease.

There was alcoholism, especially among the younger males and the unemployed. This occasionally ended in violence and in the emergency room. Alcohol is not sold on the reservation but there is bootlegging, and people have devised all kinds of schemes to get alcohol—even filtering hair spray through bread. Unfortunately, at each entrance to the reservation is a white-owned liquor store. Hardly anybody smokes.

Heating on the reservation is done with wood or coal in potbelly stoves. Chopping wood often leads to chest pain and I was often hard up to rule out coronary artery disease. In the winter and spring I saw much infectious disease, especially otitis media, often superimposed on perforation and chronic disease. Strep throats were not uncommon and there was quite a bit of pneumonia. Injuries are also fairly frequent considering their continuous exposure to animals and their love for rodeo and bull riding.

Dental health is bad and the dental clinic was always busy. The eye clinic saw much pterygium, apparently related to the sun, low humidity, wind and dust.

The Navajo are a pastoral people who tend to their sheep, goats and cows, and they love their horses. They live in extended family camps, sometimes far away into the desert. Their diet consists of mutton stew, fry bread, beans, squash, corn and other vegetables. They love fruit. They have no feeling for time. One minute, one day, one month—it does not matter. They wait patiently.

Death is a taboo for the Navajo. There is no word for it and they may say "No hear." The dead are quickly buried and no longer spoken about. If death occurs inside the traditional octagonal hogan it either gets burned or needs a cleansing ceremony. This may be, in part, the reason so few Indians go into the medical or related professions. All physicians at the clinic were white and only one physician assistant was Navajo. Some of the nurses were Navajo. Those that become nurses are usually Christians. We did have some premedical students from Flagstaff visit and work with us in the clinic. They were mostly female, all Navajo and one Zuni.

There are many other superstitions. A pregnant woman is not to see a dead animal for fear that it means bad health for the fetus. The horned toad, which is a mini dinosaur-like lizard, is considered good luck and good health and is held against the heart and neck. The Navajo consider children a blessing and have many. Grandmothers are the most important people in this matriarchal society, which has hardly any nursing homes or daycare centers.

Medicine men are important and very active. They are also very expensive and are paid with woven baskets, rugs, blankets, money or food. Interestingly, I had medicine men as patients and they have no problem with western allopathic medicine.

There are many ceremonies, mostly for healing purposes. They usually start at a full moon and may last days and weeks. The medicine man may take a piece of skin eruption and bury it under the threshhold with an arrowhead to make the rash go away. He will suck the skin of the neck until a "hickey" or blood appears and he spits it out for a cure.

There are still some puberty ceremonies to prepare the young girl for womanhood, healing ceremonies and those to drive away evil spirits—the skinwalkers who hide in crowds, or witches who put curses on people.

Corn pollen is used in most ceremonies; grease and coal from cedar ashes are also used. There are drums, chants, fire, rattles, crystals, herbs and sand paintings. I have also seen sap-plasters for pain relief. We had hospitalized patients that were taken out for a brief ceremony and then brought back to us.

There is poverty in this third world in the middle of the United States. A wife of one of the dentists told of a public school child who slept with his sister in the back of their pickup. And when somebody knocked on the door at night to sell me a kachina doll for gas money, the poverty became more real.

It was a simple life—close to the earth, the mud, the red dust, the wind, the many flowers of spring and the magnificent blue sky. We had no TV, no newspaper, and barely a radio station during the day. I didn't know that Monica Lewinski existed until sometime in May. The biggest cultural shock was not to go there but to come home to one's possessions. Thus started my retirement, and I celebrated my 70th birthday with a Navajo Country Western Band.

I scheduled one patient for gallbladder surgery. She did not show up. She came in for the surgery a week later. Her kids had taken her pickup truck, and she had no transportation, no telephone or way to notify us.

Guest Editorial

Who Manages Care? Counterpoint

by Ron H. Stark, MD, FACS

My colleague, Maynard D. Poland, MD, has written a thought-provoking editorial addressing the issue of who should manage care (*WMJ* 98;8:10). I know Dr. Poland personally and hold him in high esteem and have no reason to believe that there is anything other than altruistic thoughts in his article. However, I find a number of his points difficult to agree with. As is my nature, I choose to state my disagreements in a public forum.

Doctor Poland makes the statement that over the last 15 years, "other stakeholders in health care" have now begun to play a major role in the health care system. I could not agree more with him in that regard. Where I disagree is that the control of the health care system by these "other stakeholders" is either inevitable or appropriate. Let me expand upon that.

At the present time, we are involved in a health care system that is largely dominated by parties who have no particular role in the day-to-day treatment of the patient. By that, I mean the patients employer, the insurance company bureaucrat, or the federal or state government. To the extent possible, we need to empower patients to be in control of their own health care. The only way to do this is to create a system in which patients have a true choice in their health insurance coverage.

We need to redesign the system so that employers and the federal and state government are not the principal purchasers of insurance. This could be done by creating a private health insurance system in which patients purchase their own health insurance. Our employers do not provide us with our food, clothing, housing or means of transportation. Why should our employers, or the federal government for that matter, be involved in one of the most personal aspects of our day-to-day life, namely our health care? We could redesign a system in which the individual purchases his or her own health insurance policy based upon community rating. Where government could play a useful role would be in mandating that all people have health insurance. We cannot have a system of universal access if people are not required by law to purchase health insurance.

The federal government also need not have a system in which they control prices and access, but rather offer a voucher system in which a certain amount of money is allocated to those who cannot afford to purchase health insurance or are over a certain age. With those vouchers, people could then purchase the health insurance that they desire. A certain minimal standard would be offered to all and people could then allocate further resources for the level of care that they individually felt was appropriate for their needs.

The liberal argument is, of course, that we would then have a "two-tiered health care system." We already know that we have a multi-tiered health care system presently. The "dirty little secret" is that the middle class worker is the person least likely to be able to obtain adequate health insurance while the elderly and the poor are assured a higher level of care than that available to many working families.

If this type of system were to be put in place, the patient would again become the center of the health care system. The current problem revolves around the fact that our managed care system incentivizes profits over patient care. No matter how Dr. Poland wishes to state it, we still have a system that is profit driven. Classic medical ethics have been stood on their head. No matter how you attempt to rationalize what has gone on, we cannot get back to a reasonable system without recognizing that this conflict of interest exists.

Doctor Poland further makes a statement that many physicians and organized medicine as a whole are "reactive" rather than "proactive)'. I think that should not be considered a criticism, but rather a compliment. I would hope that physicians and organized medicine would remain "reactive" to some of these forces involved in managed care. Some of the progress we have made has been because many physicians and patients have been unwilling to capitulate to

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Doctor Stark is a board certified surgeon and hand surgeon in private practice in Milwaukee. He is a past president of the Medical Society of Milwaukee County.

An Unconventional Clinical Experience: Learning to Serve Wisconsin Communities

by Deborah L. Buchman

The SMS Foundation Preceptorship Program provides medical students with health-related governmental and political action experiences. It also seeks to raise the visibility of the SMS Foundation within the student population. Since I have always been somthing of a social activist, I was looking for a way to integrate my interest in public health with a career in medicine. I am most grateful that I was the 1999 recipient of this preceptorship and had the opportunity to get a stipend while I participated in many community-based healthcare programs throughout Wisconsin.

My summer preceptorship experience was exciting, exhausting at times, and above all, eye-opening. Last year in Gross Anatomy I dissected a human brain; in Physiology I learned about what makes the heart beat; in Pathology I learned about common causes of disease. But nowhere in my classes did I speak with women who endure the stresses of living with domestic abuse, visit the homes of underinsured and uninsured young parents, or witness the difficulties of obtaining health care in the face of language and cultural barriers. Based on my interests in pediatrics, early intervention, and community-based wellness systems, I was introduced to a wide variety of public health programs, and I am indebted to Dr. Richard Aronson and his colleagues at the State Department of Public Health who shared their time and knowledge.

Through my experiences, I met people with very diverse backgrounds and goals, yet three characteristics seemed to drive the success of each of their programs. First, the most successful organizations focus on the positive attributes of a situation when designing health care intervention programs. For example, rather than reexamining the risk factors known to increase infant mortality, the Milwaukee Healthy Beginnings Project celebrates resiliency factors that may be linked to positive birth outcomes in inner-city situations. Second, innovative leaders cross the conventional boundaries of their professions and bring together people with different ideas and experiences to effect change. The steering committee of the Common Ground Conferences includes public health officials, researchers, local social activists and several members of the targeted at-risk communities. This unique group takes unconventional paths to reach seemingly unattainable goals. Third, the people I met in public health continually analyze the effectiveness of operating programs in order to improve the quality and efficacy of their interventions.

Throughout medical school and my career, I will focus on these basic elements for successful public health programs: center on attributes, cross boundaries and continually evaluate program effectiveness.

In addition to meeting real people with real health needs during my preceptorship, I also participated in the business aspect of public health. I got experience in editing CATCH grant proposals and attended a Request for Proposal peer review meeting. I learned that proposed intervention plans must be necessary, well thought out and capable of succeeding before receiving funding from the State Department of Public Health. Every day was signficant as I was introduced to the services currently available in the state, and to the public health needs that still need to be addressed.

The SMS Preceptorship Program extends beyond the summer. As part of this preceptorship I wrote an article, "The First Years Last Forever," which appeared in the December issue of the *Wisconsin Whisper*. It outlines the latest research on early brain development and provides information on related state programs and resources. I established the Public Health Interest Group at the University of Wisconsin Medical School where students have a forum for discussing the social and cultural issues that impact the health of our society. Projects have included a panel discussion led by Doctors Richard Aronson and Susan Skochelak about MD/MPH career opportunities and a presentation on early brain development.

Current and future projects include the presentation of the March of Dimes Folic Acid Campaign in the "Ounce of Prevention" health fair at East Towne Mall, cooperation with the AMA Student Interest Group in bringing

Ms. Buchman is the 1999 SMS Medical Student Preceptorship Recipient, UW-Madison Medical School.

Badger Care Health Insurance information to Dane County residents and involvement in the SMS-sponsored "Smoking: Truth or Dare?", a teen-age smoking cessation and prevention program. Also, plans are being made to provide more comprehensive Medical-Spanish lessons at UW-Madison to prepare future physicians to work with the rapidly increasing population who speak Spanish as their first language.

The more programs SMS members are aware of, the more health care options they can offer their patients, especially defined populations. In addition to those mentioned above, programs to note include The Milwaukee Healthy Beginnings Project, The Healthy Steps Programs emphasizing the importance of early brain development on social and intellectual growth, Common Ground Conferences examining the African American infant mortality rate in Milwaukee, the Latin Health Organization Domestic Violence Clinic, Operation Fresh Start for at-risk teens in Madison and Home Visitation programs, just to name a few. Detailed information on these and other programs may be obtained by contacting local Public Health Departments.

The SMS Foundation Medical Student Preceptor Program should be expanded so many more students can benefit from this experience. Physicians are in a unique position to effect social change. The people I met through this program touch the lives of thousands of people. Their dedication, creativity and optimism in serving Wisconsin communities exemplify the professionalism that I hope to achieve in my career.

WMJ

Call for Papers, Reviews, Commentary

In 2000, *WMJ* will examine issues related to public health in Wisconsin. The *WMJ* Editorial Board is seeking original manuscripts related to these themes:

Infectious Disease (to be printed in August)
Deadline for peer review papers: May 15
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Deadline for peer review papers: August 15
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Environmental Health (to be printed in November)
Deadline for peer review papers: September 15
Deadline for other submissions: October 1

Injury Prevention (to be printed in December)
Deadline for peer review papers: October 15
Deadline for other submissions: November 1

In addition, general scientific papers are always appreciated and will be published on a regular basis. All submissions should conform to *WMJ* requirements. For further information contact Kendi Parvin, Managing Editor at 608.257.6781, toll-free at 800.362.9080, or via e-mail at: kendip@smswi.org. Instructions to authors are available on the SMS website at www.wismed.com.

Managed Care Counterpoint

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unreasonsonable demands by managed care companies. While I fully agree with many of the statements Dr. Poland has made regarding our need to look for more cost effective ways to offer health care, I don't believe we should "throw the baby out with the bath water" either. By that, I mean I don't think we need to give up a patient-centered medical profession where the interest of the individual patient is always our top priority.

I would suggest to Dr. Poland and to my colleagues that we need to continue to fight to maintain the physician's control of appropriate medical decision-making. We also need to fight to empower our patients to again be the center of our focus. We need to get the Wall Street entrepreneurs and the government bureaucrats out of the examination room and back doing what they are more appropriately trained to do.

In conclusion, let me state that I believe physicians should continue to manage care.

While I believe there is a place for some managed care techniques, there is more appropriately a need to put patients back in control of their own health care. That is what the public wants and we are beginning to see that revolution occur. Many of the things that Dr. Poland has pointed out are true. However, many of the statements would harken back to 10 years ago when we were told that managed care was the future. Clearly, as it has been defined over the last 10 to 15 years, managed care will not work or be tolerated in this country. I, for one, would like to see organized medicine at the forefront of a movement to design a new health care system that puts patients first and allows physicians to practice medicine based upon sound science and medical ethics.

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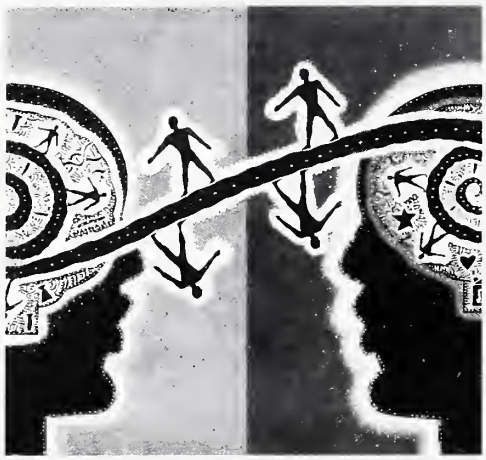

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Guest Editorial

What is Public Health?

by John Chapin, Administrator, Division of Public Health

The Division of Public Health within the Department of Health and Family Services greatly appreciates the invitation from *WMJ* to partner on the development of five issues dealing with public health.

The importance of using *WMJ* as a vehicle for physician education about public health cannot be over-estimated. Many of these articles will appear to some readers to be "non-scientific" and the temptation may be to skip through to find the "hard" stuff. However, those physicians whose interests are in bench research and clinical trial data need to linger over these narrative descriptions of public health. The entire physician community, and not just those already engaged in it on a daily basis, needs to understand what public health is about.

Epidemiology is a science of public health as are scores of other disciplines used by public health; but public health is not, in and of itself, a science. It is:

> "a means for protecting and promoting the health of the public through collaborative actions designed to build and sustain healthy people, communities and environments."

This concept of public health as an active local partnership of government, private providers, non-public community-based organization and voluntary groups is the key to public health progress. The above is a definition currently being debated by Wisconsin's Turning Point Program. This is a process led by 50 prominent Wisconsin public health citizens working to redefine public health, identify core functions, fundamental services, the infrastructure needs of public health, year 2010 goals and objectives, and the central public health risk conditions that need to be addressed in Wisconsin. Many SMS representatives are playing a prominent role in this process.

I look forward to sharing the results of Turning Point with you as their work is completed over the next year. If you have the opportunity, please consult the DHFS web site for the draft document: "Wisconsin's 2010 Public Health Improvement Plan" at http.// www.dhfs.state.wi.us/health/ TurningPoint/Tpindex/.

Describing the reality of public health in Wisconsin is, therefore, not just a scientific medical research task; but a reflection on the interaction of politics, economics, education, demographics and sociology that shapes the health of society. At the local and state level, it is not just about health care professionals; it is about the entire infrastructure of public health in Wisconsin. Public health has the whole community as the patient. It is not about health care for any given individual, it is about the aggregate health status of all Wisconsin citizens and their attitudes towards a healthy life style. Public health outcomes are as much influenced by the educational and economic structure of a community as they are by the physician, the hospital, and the clinic. The infrastructure encompasses the capacity of a community for public health assessment, policy development and assurance. This is what determines the ability of public health to influence the health status of the community.

The school superintendent who supports health classes is just as important as the physician; the businessman who prohibits smoking in his/her restaurant is as important as the public health nurse; the firefighter who is an EMS volunteer is as important as the WIC director; and parents that provide good nutrition to their children are as important as the health educator.

This is the story behind the overall health status of Wisconsin citizens, the historical evolution of that status and the identification of what can be done to improve that status within the existing social, economic and political context. The comparative impacts of behavioral change and social factors on age-adjusted average annual death rates per hundred thousand is very large. Changes in factors such as rates of high school graduation, employment rates, health insurance access, smoking rates, dietary/obesity factors and exercise/ sedentary habits are as important as any changes in medical technology or practice patterns.

By telling the story of public health in *WMJ*, we hope to expand the already considerable participation of Wisconsin physicians in public health. The real public health struggle is not scientific or technical, but a political, social and cultural process of focusing policy and resources where they are needed and changing community behavior and norms. This is where the support of the entire physician community is needed.

Transforming MCH to Enhance the Health and Safety of Children, Families, and Communities in Wisconsin

A Work in Progress

by Richard A. Aronson, MD, MPH

Introduction

In 1989, more than 150 citizens from all walks of life generated *Healthier People in Wisconsin: A Public Health Agenda for the Year 2000*. This wide-ranging public health plan provided a context for the Wisconsin Division of Public Health's efforts to enhance the health and safety of the state's children and families. In responding to the complex challenges needed to achieve objectives such as the reduction of low birth weight, the Division established Five Guiding Principles in 1993: family-centered care, community-wide leadership, resiliency, outreach, and cultural competence. The overarching purpose of these principles is to define the culture of maternal and child health services in Wisconsin so that both providers and recipients of services engage in partnerships to enable them to tackle thorny challenges that affect all of us and to build a sense of community.

This paper provides an overview of the Guiding Principles; cites the African American Infant Mortality Resiliency Project as an example of efforts to implement them; describes an effective maternal and child health program (the Women, Infants, and Children Program); and draws the reader's attention to "Child Health in Wisconsin: Data and Dialogue," a set of slides and speaker notes designed to allow physicians to assume a leadership role in enriching a community-wide dialogue on ways to secure a better future for Wisconsin children.

Doctor Aronson is Chief Medical Officer for Family and Community Health, Wisconsin Division of Public Health

Challenges

Today's children and families live in a period of rapid social change. The economic organization of the health care and social service systems in the United States, including Wisconsin, is in the midst of profound changes. The structure of families and patterns of family life have undergone major changes during the past 30 years.

No single agency, system, or medical practice can effectively take the action needed to maximize the health and safety of children and families. People, organizations, and systems have worked too often on their own, making it difficult for communities to develop and sustain systems of care that help equip children and families with resources that help them to empower and uplift themselves. Creative and proven-to-work prevention strategies – home visiting, one-stop shopping, and mentoring – have been hindered by systemic tensions that repeatedly get in the way. They include reactive rather than proactive leadership, turfdom, political maneuverings, competition for funds, a pervasive lack of trust in government, and historically entrenched cultural chasms caused by racism, sexism, and other institutional inequities.

Five Guiding Principles

1. Family Centered Care

The family plays the central role in the health and safety of children. It is the most powerful, the most humane, and by far the most economical system known for enabling children to become compassionate and productive citizens. Parenthood should be thought of as a profession, requiring levels of preparation, understanding, discipline, and commitment.

Family-centered programs recognize and respect the expertise of families as policy and program advisors; seek out opportunities to involve families in advisory activities; use a variety of strategies to identify and recruit families to serve in advisory roles; and demonstrate appreciation for the contributions that families make to policy and program development.

2. Community-Wide Leadership

A key component of an effective MCH program is the capacity and skill of a community to bring

people together from many walks of life to achieve public health objectives such as reducing racial and ethnic disparities in infant mortality. The community-wide leadership principle refers to the practice of inclusive leadership that links the health of the community to the health of its children and families.

Community-wide leadership strives to create an environment that affirms the power and responsibility for all stakeholders – citizens, families who receive services, health care and social services providers, business, education, and others – to envision, collaborate, and risk. It honors all stakeholders as equal partners in moving toward achieving the vision of a healthy and secure future for Wisconsin children.

3. Resiliency

The most direct path to a population's optimal health is through healthy relationships among people who value and respect one another, who challenge and support shared responsibilities for each other, and who seek and affirm assets, strengths, talents, and resiliency within themselves, families, neighbors, and the community. The Guiding Principle of resiliency refers to the capacity of children, families, neighborhoods, and communities to "bounce back" in spite of stressful circumstances. It speaks to the power of people to recover, heal, grow, and succeed when faced with adversity. Key components of resiliency include the following:

- Support – Children need to experience support, care, and love from their families and others.
- Dignity and respect – Health care, social service, and educational systems should value children and families as human beings with the potential to succeed in the midst of stress. Pregnant women who participate in Wisconsin's Prenatal Care Coordination Program repeatedly tell their home visitors they are tired of being viewed as bundles of risk factors, morbidity, and mortality. Like all people, they want to be recognized for their talents and assets.
- Boundaries and expectations – Children need and want to know what is expected of them and whether activities and behaviors are "in-bounds" or "out-of-bounds."
- Constructive use of time – Children need constructive and enriching opportunities for growth through creative activities at home and in the community.
- Commitment to learning – Children need to develop a lifelong commitment to education and learning.
- Positive values – Children need to develop strong moral values that guide their choices and decisions.
- Positive identity – Children need a strong sense of their own power, purpose, worth, and promise.

4. Outreach

Maternal and child health programs should demonstrate leadership in planning and putting into practice local efforts to achieve public health objectives. This requires a concentrated outreach effort that engages patients in helping to design programs that involve families of highest need. They must determine the most effective outreach methods for serving or assuring service for that population. Examples include an effective program of benefits counseling and referral assistance, efforts that increase volunteerism, mechanisms that maximize third party and other revenue sources, measures that eliminate waste and duplication of effort, and techniques that result in increased services to the population. By becoming aware of community resources and getting to know the people who direct them, physicians can play a central role in outreach.

Recent outreach efforts are bearing fruit both for Medicaid and BadgerCare. BadgerCare, which covers uninsured children and their parents with household incomes below 185% of the federal poverty level, enrolled 60,000 people in its first nine months. The percentage of BadgerCare-eligible people who are actually enrolled is significantly greater than other states' Child Health Improvement Program (CHIP) enrollments at similar program stages. One significant indicator of overall outreach success is that 30% of BadgerCare recipients had not previously received other major public assistance programs such as WIC and family planning.

The State Medical Society has performed a central role in Medicaid outreach, from strong policy endorsement to brochure distribution, especially for "working poor" families. Physicians and their office staff are valuable assets in Medicaid outreach and enrollment.

5. Cultural Competence

US Surgeon General Dr. David Satcher has established a Year 2010 public health objective of 100% access to health care and zero disparities in health status for all citizens. Attaining such an ambitious and significant public health objective depends on the capacity of all of our health systems to deliver culturally-competent care. Cultural competence refers to a set of behaviors, attitudes, and policies that enable a system, organization, or medical practice to work effectively in cross-cultural situations.

Perhaps the biggest challenge in promoting cultural competence is for people, families, communities, and organizations both to celebrate the rich and growing diversity of Wisconsin and, at the same time, to discover and act upon common ground. The underlying task is for systems, organizations, programs, and policies to foster opportunities

to listen to each other's voices in much more profound ways than we have done in the past and to use the information we gain to drive our actions.

Success in shaping family-centered, resiliency-based, and culturally competent systems requires long-term commitment of time, energy, and resources. Physicians can take part in this effort by linking up with informed and engaged citizens. Efforts are needed to build the capacity of both groups to be good collaborators. A tough part of this job is that physicians and other health care providers want to assume the lead based on what we perceive as our expertise. In fact, we are technical experts, and our citizen colleagues frequently have far more expertise in how communities work, how they are organized, and how they make decisions.

The principles reflect an underlying belief in the potential for communities as a whole to become healthy and for the core human values of dignity and respect to become the cornerstones for healthy children and families. This means that the essence of MCH lies not only in the prevention and reduction of morbidity, mortality, and risk, but also in fostering the potential of children and families to become compassionate, productive, and dignified citizens of their communities and of society as a whole.

African American Infant Mortality

An example of a Wisconsin initiative rooted in the Guiding Principles is the African American Infant Mortality Resiliency Project. As reported in another article in this issue of *WMJ*, infants born to African American women in Wisconsin are three times as likely to die in the first year of life as infants born to white mothers are. This disparity has increased in Wisconsin since 1980 and exceeds the disparity for the nation as a whole.

Previous research has attempted to explain disparities in health outcomes by focusing on traditional risk factors such as differences in socioeconomic status and higher levels of risk behavior among African American women. However, according to several studies in the United States,[1,2,3] the gap between the two groups for low birth weight, a major contributing factor to infant mortality, persists regardless of socioeconomic status. These disparities may be due, at least in part, to chronic stress that all African Americans experience as a result of racism.[4] This stress may result in physiologic changes that place the individual at higher risk for a variety of illnesses and conditions, including low birth weight. Also, institutional racism may contribute to the barriers African Americans encounter when gaining access to and effectively utilizing the health care system.[5]

The Division of Public Health convened a work group in 1995 to come up with a fresh approach to reducing the African American infant mortality disparity in Wisconsin. The group includes members of the African American community (including faith-based organizations) as well as public health and medical professionals. The group has developed unique partnerships that enrich each other's understanding and practice of the Guiding Principles.

After an extensive literature review, the group concluded that behavioral and other traditional risk factors account for only about two-thirds of the gap between white and black low birth weight and infant mortality rates. The group hypothesized that stress and racism account for the remaining gap.

However, instead of studying the gap within a risk framework, the group decided to develop a study that focuses on the potential for resiliency factors to improve black infant survival. Its purpose is to determine the extent to which resiliency in African American women, families, and their communities improves infant survival and thriving. The study addresses a person's ability to thrive and takes into account the capacity to deal with less studied risk factors such as the impact of stressful life events, racial discrimination, residential segregation, and gender roles on birth outcomes and infant health. In 1999, the Wisconsin Council on Developmental Disabilities awarded the Black Health Coalition a $25,000 grant in start-up funds to pilot a resiliency questionnaire and to seek larger funding for the full study itself.

The primary leadership for the study comes from the Black Health Coalition of Wisconsin, which has carried out research on African American family resiliency related to the prevention of interpersonal violence among Milwaukee youth.[6,7] The Division of Public Health intends to use results from the infant mortality resiliency research to develop resiliency-based policies, programs, and services that specifically address closing the gap between African American and white infant mortality in Wisconsin.

WIC

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides nutrition education, health care referrals, breastfeeding support, and nutritious foods to pregnant and postpartum Wisconsin women, infants, and children under age 5. WIC is a short-term intervention designed to strengthen families by influencing lifetime nutrition and health behaviors in an at-risk population. WIC helps pregnant women have improved birth outcomes and enables parents to feed their children nutritious foods during the critical early years of growth and development.

WIC serves over 185,000 Wisconsin women, infants, and children per year. In 1997, 40% of all women who gave birth in

Wisconsin's MCH Program: Some Background

Since 1935, the federal government via Title V of the Social Security Act has provided funding to states to help them meet the needs and affirm the strengths of children and families. Recent amendments to Title V emphasize the development of community and statewide systems of care for all families. Title V-funded agencies are only one part of a comprehensive and diverse maternal and child health system in Wisconsin.

In addition to federal law, the Wisconsin Maternal and Child Health (MCH) Program is authorized by state legislation. Specifically, Chapter 253 of the Wisconsin Statutes establishes the MCH Program "to promote the reproductive health of individuals and the growth, development, health, and safety of infants, children and adolescents."

The enactment of Title V of the Social Security Act in 1935, under President Franklin D. Roosevelt, was central to the establishment of state MCH programs. Frequent amendments to Title V over subsequent years were followed by federal legislation in 1981consolidating a number of programs into the MCH Services Block Grant. These programs included maternal and child health services and services for children with special health needs; supplemental security income for children with disabilities; lead-based paint poisoning prevention; genetic disease; sudden infant death syndrome; hemophilia treatment centers; and adolescent pregnancy.

Each year, every state is required to report a number of MCH performance and outcome measures to the federal government. Examples of Wisconsin data for 1997 include the percentage of newborns screened for four major congenital disorders (99.8%); rate of deaths to children aged 1-14 caused by motor vehicle crashes (5.1 per 100,000); the percent of very low birth weight births (1.3%); and the percent of infants born to women who received first trimester prenatal care (83.9%). For each of these indicators, Wisconsin as a whole does well compared to most other states. However, racial and ethnic disparities occur for these and other measures. In addition, even the Wisconsin indicators rank behind those of many other nations.

The Division of Public Health is responsible for administering the federal MCH Block Grant in Wisconsin. Within the Division of Public Health, the Bureau of Family and Community Health is responsible for the direct oversight of the MCH Program. The Bureau's Family Health Section provides program planning and consultation. In addition, the Bureau works in concert with the Maternal and Child Health Program Advisory Committee, which includes several physicians and has played an instrumental role in supporting the direction that the MCH Program has taken during the past decade.

For further information about the Wisconsin MCH Program, please contact Millie Jones at 608.266.2684, fax 608.267.3824, or e-mail jonesmj@dhfs.state.wi.us.

Wisconsin were on the WIC program; three-fourths of the WIC births were infants enrolled in Medicaid. In 1998, the WIC program served about 90% of the minority birth to age 5 population and nearly 40% of all Wisconsin children younger than 5.[6]

Numerous federal and state studies of the WIC program have documented its benefits.[7] They include improved diets for pregnant women and children, including intake of key nutrients such as protein, calories, iron and vitamin C. For pregnant women, studies have demonstrated earlier entry into prenatal medical care, reduced incidence of low birth weight babies, and premature births, and fewer fetal and infant deaths.[6,7]

WIC is cost-effective; a 1992 General Accounting Office (GAO) study showed that the provision of WIC benefits to pregnant women has a cost-benefit ratio of approximately 3:1.[8] In addition, other studies that examined Medicaid payments to WIC families showed cost-benefit ratios of $1.92 to $4.21 for every dollar spent on the WIC program.[9]

Wisconsin WIC data on low birth weight show that the percentage of babies with low birth weight (< 2500 grams) decreases according to the length of time during pregnancy that a woman is enrolled in WIC. Table 1 shows that pregnant women enrolled in WIC for three trimesters during the period of 1994 through 1998 had a lower percent of low birth weight babies (<2500 grams) compared to all Wisconsin women who gave birth. The *Healthier People in Wisconsin* low birth weight objective was that no more than 5% of newborns would weigh less than 2500 grams by 2000.

Since 1994, the Wisconsin WIC Program has participated in two surveillance systems, the Pediatric Nutrition Surveillance System (PedNSS) and the Pregnancy Nutrition Surveillance System (PNSS), administered by the Centers for Disease Control and Prevention (CDC). These surveillance systems monitor nutritional and behavioral risk factors among low-income women and their children and progress towards the

Regional centers funded to meet special health care needs of children

An estimated 15% to 18% of children in Wisconsin are children with special health care needs (CSHCN). Children with special needs range in age from birth to 21 years and have a long term, chronic physical, developmental, behavioral, or emotional illness or condition. The illness or condition is defined by the following characteristics:

- It is severe enough to restrict growth, development, or the ability to engage in usual activities.
- It has been or is likely to be present or persist for 12 months to lifelong.
- It is of sufficient complexity to require specialized health care, psychological, or educational services of a type or amount beyond that required generally by children.

Examples of conditions that meet the definition for children with special needs include cerebral palsy, leukemia, diabetes, autism, Attention Deficit Hyperactivity Disorder, and severe asthma.

Recent federal improvements in the CSHCN service system began through amendments in the 1989 Federal Omnibus Budget Reconciliation Act. These amendments to Title V of the 1935 Social Security Act require states to provide family-centered, culturally-competent, community-based, and coordinated care. As a result, in 1991, the Wisconsin CSHCN Program conducted a statewide needs assessment in partnership with parents and providers. Based on the findings of the needs assessment and subsequent recommendations by the MCH Program Advisory Committee, the Wisconsin CSHCN Program articulated a new program vision. This vision reflects a change from the provision of direct financial assistance or payment of medical services to the development of a systems public health approach to services.

Regional CSHCN Centers

Northeastern Regional CSHCN Center
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The philosophy and principles of this vision of a systems approach are the following:

- Children are best served within their families.
- Children and families are best supported within the context of their community.
- Families should have convenient access to care coordinators.
- Collaboration among diverse and interdisciplinary people and groups is the best way to provide comprehensive services.
- Family perspectives and presence must be included in all aspects of the system.

Five Regional CSHCN Centers have been funded as of January 2000 and are located in each of the five Division of Public Health Regions. The Centers will increase the capacity of local communities, including local public health departments, to serve families and will work together to form a statewide, integrated system. The Centers will begin to offer services to families and providers by July 2000, after an initial 6-month period for infrastructure development and start-up activities.

The goals of the Regional CSHCN Centers include the following:

- Provide information, referral, and follow-up services, once a diagnosis has been made, so that all children with special needs, families and providers have access to complete and accurate information.
- Promote a parent-to-parent support network, with parents as paid staff, to assure that all families have access to parent support services and health benefits counseling.
- Increase the capacity of local health departments and other local agencies, such as schools, to provide service coordination through education, training, and ongoing technical assistance.

year 2000 and 2010 national health objectives.

Selected outcomes of the 1998 PedNSS and 1997 PNSS systems for Wisconsin were the following:

- *WIC Enrollment by Trimester of Pregnancy:* Early entry into the WIC program improves birth outcomes through nutrition interventions and linking pregnant women with other needed health and social services. The percentage of pregnant women who enrolled in WIC in the first, second, and third trimesters were 41%, 37%, and 22% respectively in 1998.
- *Gestational Weight Gain:* Women who gain less than ideal weights during pregnancy are at increased risk for preterm birth and delivery of a low birth weight infant. In the 1997 PNSS, about 43% of the WIC women gained the recommended amount of weight during pregnancy. About 29% of women gained more weight than recommended, which increased their risk of having a high birth weight infant and possibly caused them difficulty returning to their prepregnancy weight after delivery. The Year 2010 national objective calls for an increase in the proportion of mothers who achieve a weight gain consistent with the Institute of Medicine guidelines.[10]
- *Breastfeeding:* The nutritional, immunologic, allergenic, economic, and psychological advantages of breastfeeding are well recognized. Approximately 49% of WIC infants were breastfed initially. Twenty-nine percent were breastfed for 3 months and 21% for 6 months. Hispanic infants were most likely to be initially breastfed (70%), followed by American Indian (57%), white (56%), black (37%), and Asian (27%) infants. The Year 2010 objectives are to increase to at least 75% the proportion of mothers who breastfeed their babies in the early postpartum period and to at least 50% the proportion of mothers who breastfeed until their babies are 6 months old, and to 25% until 1 year old.
- *Overweight Children (>95th-percentile weight/height):* The overall prevalence of overweight among WIC children in Wisconsin, ages 2 to 5 years, was almost 8%. The prevalence was highest among American Indian (15%); Hispanic and Asian rates' were 11% and 12%; and white (7%) and black (6%) rates were the lowest. The prevalence of overweight in the national PedNSS increased from 7% in 1989 to 9% in 1997. These PedNSS results are consistent with the trend of an increasing overweight child population in the United States.[11] The Year 2010 objective is to reduce to 5% the proportion of children and adolescents who are overweight or obese.
- *Anemia:* Iron deficiency in children is associated with developmental delays and behavioral disturbances.[12] In Wisconsin, there was a decrease in the percent of PedNSS WIC records with anemia from 21% in 1994 to 17% in 1998. In the 1998 PedNSS, 18% of children under 2 years and 16% of children ages 2 to 5 years were anemic. The highest rate of anemia was in black children (31%); Asian and Hispanic (16%) had the next highest rate; and American Indian (13%) and white (11%) babies had the lowest rates. 1998 Wisconsin WIC program data indicate that more than 76% of the children initially identified with anemia had improved hematocrit/hemoglobin values after 6 months of WIC participation.[13] The Year 2010 objective is to reduce iron deficiency among young children to 5%.
- *Cigarette Smoking:* Maternal smoking during pregnancy and passive smoking exposure are risk factors for Sudden Infant Death Syndrome (SIDS), low birth weight and preterm infants, and spontaneous abortion. About 42% of Wisconsin WIC women in the 1997 PNSS reported smoking before pregnancy, and about 30% reported smoking during pregnancy. Of these pregnant women, 81% reported smoking less than one-half pack per day. In the 1997 PNSS, the prevalence of self-reported smoking during pregnancy was found higher for American Indian women (44%) and white women (38%). Black women (22%) had the next highest rate and Hispanic (9%) and Asian (2%) women had the lowest rates. The Year 2010 objective calls for a reduction in smoking prevalence to no more than 5% among pregnant women.

Table 1. Percent of Infants Born at Less Than 2500 Grams, Wisconsin WIC Clients (on WIC for 3 Trimesters) and All Wisconsin Births, 1994-1998

Year	Enrolled prenatally on WIC for three trimesters who gave birth	All Wisconsin women who gave birth
1994	4.8	6.4
1996	4.9	6.3
1997	4.4	6.4
1998	4.9	6.5

Sources: WIC 814 report and Wisconsin Department of Health and Family Services. Wisconsin Bureau of Health Information. Wisconsin Births and Infant Deaths, 1994-1998.

To qualify for WIC, a potential recipient must have an identified nutritional need, such as a level of iron in the blood or an inadequate diet. The program serves women and children whose family income is within 185% of federal poverty guidelines, the same upper limit that currently exists for BadgerCare and Healthy Start. For

instance, a family of four with a monthly income less than $2,574 would qualify. The WIC program is available in every county in the state. It is administered locally through 230 clinics operated by 68 local health departments, private non-profit agencies, and tribal health agencies.

Physicians can play a leadership role in WIC by informing patients of the program's benefits and encouraging them to call or visit a WIC project; giving them the Maternal and Child Hotline number (1-800-722-2295) to locate the nearest WIC Project; displaying WIC posters and brochures; contacting the local WIC Project to obtain these materials, available in English, Spanish, and Hmong; and including WIC outreach brochures in obstetric, newborn, and pediatric packets.

Data and Dialogue Slides

"Child Health in Wisconsin: Data and Dialogue" is a comprehensive slide program that highlights, on a county-by-county basis, the health status of Wisconsin's children. It highlights and expands on much of the information presented in this article. The program includes the following:

1. Health status outcome measures, including low birth weight, infant mortality, child death rates, teen violent death rates, and teen birth rates.
2. Implementation steps to improve these measures.
3. Examples of successes in Wisconsin in addressing them.
4. Persisting and emerging challenges.
5. Socioeconomic status indicators, including poverty rates, gross per capita income levels, single parent households, and high school dropout rates.
6. Health care provider information, including the ratio of children to primary care physicians who serve children.

The packet includes 48 color slides assembled in a slide carousel, and extensive speaker notes go with each slide. The presentation represents a four-year collaborative effort led by the Wisconsin Chapter of the American Academy of Pediatrics (AAP), in collaboration with the Center for the Advancement of Urban Children at the Medical College of Wisconsin, the Children's Health Alliance of Wisconsin, and the Division of Public Health.

The purpose of the slide presentation is to stimulate all communities in Wisconsin, regardless of how they fare relative to each other, to probe deeper into the health status of their children. Performance and outcome measures of this nature should serve as the driving force for organizing resources and priorities.

By presenting these slides, physicians can play a lead role in enriching a community-wide dialogue on ways to secure a better future for Wisconsin children.

The Children's Health Alliance of Wisconsin is handling the dissemination of the slides. To order or borrow a set, please call the Alliance at 414.266.6172, contact them by fax 414.266.6975, or by e-mail at chaw@chw.org.

The slides and notes are also available from the Wisconsin Chapter of the American Academy of Pediatrics by contacting Carolyn Evenstad at 608.222.7751. For questions about the presentation's content, please call Dr. Richard Aronson at 608.266.5818 or e-mail aronsra@dhfs.state.wi.us.

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Guest Editorial

Wisconsin's Children Need More Calcium

by Mary Marcus, MS, RD, and Susan Nitzke, PhD, RD

The quality of children's dietary intake has been declining in the United States, with heightened concern in the past decade for calcium intake. The average national intakes of milk and dairy foods by children are only 42% to 76% of dietary recommendations.[1] Osteoporosis, or low bone density, has until recently been considered a disease of old age. The focus of concern for children has been highlighted by a 1999 statement by the American Academy of Pediatrics committee on Nutrition: "it is reasonable to conclude that low calcium intakes may be an important risk factor for fractures in adolescents."[2]

The Nutrition Power Task Force (NPTF) of Wisconsin has identified calcium intake of children as a priority for health promotion activities in the year 2000 and we have developed a three-pronged approach to address this issue: healthcare, school, and community. The NPTF, formed in 1994 to improve the learning readiness and nutritional health of children in Wisconsin, is a joint program of seven statewide organizations concerned with the nutritional health of children and includes representatives from the Wisconsin Dietetic Association, the State of Wisconsin Department of Health and Family Services and Department of Public Instruction, the University of Wisconsin-Cooperative Extension, the Wisconsin School Food Service Association, the Wisconsin Technical College System, and the Dairy Council of Wisconsin.

Ms. Marcus is with the Wisconsin Dietetic Association; Dr. Nitzke is with the University of Wisconsin-Cooperative Extension. Both represent the Nutrition Power Task Force Education Committee. Reprint requests to Mary Marcus, MS, RD, F4/120 University of Wisconsin Hospitals and Clinics, 600 Highland Ave, Madison, WI 53792; 608.263.8245; email ms.marcus@hosp.wisc.edu.

Healthcare Approach

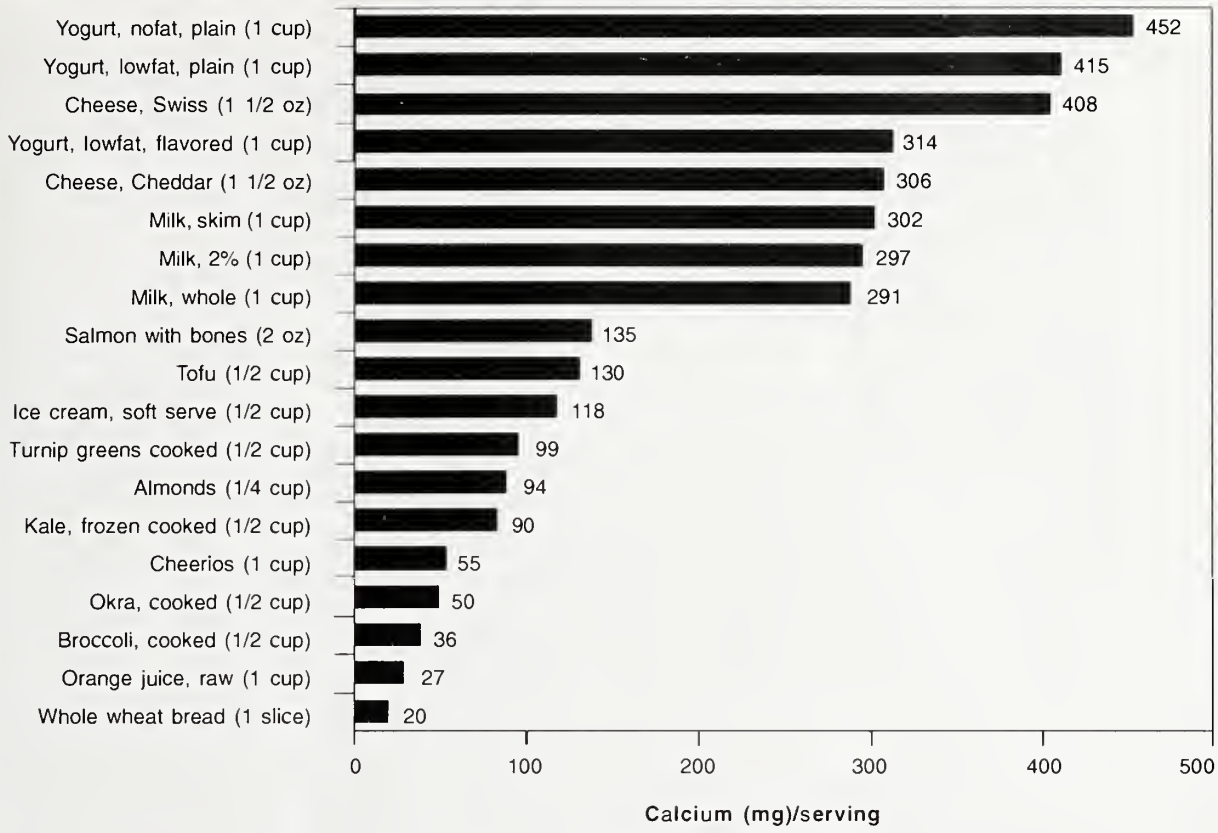
Physicians and other healthcare providers play an integral role in identifying children with increased risk of bone fractures and other health problems that develop over the course of the lifecycle. Practitioners should be alert to risk factors including inadequate dietary calcium and vitamin D and insufficient exercise. Low intakes of calcium and vitamin D are attributable in large part to the increasing popularity and accessibility of soft drinks at the expense of milk consumption.[3] For example, only 12% of 15- to 18-year-old girls consume the dietary recommendation for milk and dairy foods,[1] as diet soda has become their beverage of choice. In addition, adolescent girls are increasingly concerned with body weight and dieting. This population may benefit from reassurance that skim milk and low-fat or fat-free yogurt are good, low-fat sources of calcium. Other sources of calcium include cheese, tofu made with calcium, calcium-fortified juices and cereals, green vegetables and legumes.

Careful counseling should recognize cultural food/beverage preferences and the higher prevalence of lactose intolerance among people of African, Hispanic/Latino, Native American, and Asian descent. Strict avoidance of all milk and dairy foods is not necessary unless the child has been diagnosed with milk-protein allergy. Children with lactose intolerance can generally drink small amounts of milk with meals, eat yogurt and cheese, and use lactose-reduced products to help meet their calcium needs.[4] Children and adolescents who cannot or will not eat dairy products should be advised to consider supplements and/or calcium-fortified foods.

School Approach

Schools are in an ideal position to provide nutrition education, particularly on the importance of calcium. Schools are also facing spending caps, requiring them to find alternate sources of revenue. This has opened the door for soft drink companies to promote their products within the confines of the school. Schools potentially receive more revenue as soft drink sales increase. Thus, some schools are forced to compromise their ideals by selling a product with empty calories. This may be detrimental to the health of children as soft drinks replace milk in their diets. Physicians and other healthcare providers can serve as needed resources for schools, as difficult decisions are made on health-

Figure 1. Calcium contribution of foods



related issues. For example, physicians and other healthcare providers can encourage schools to promote healthy food and beverage choices in the school cafeteria, vending machines, school store, and sales at school-sponsored activities.

Community Approach

It is critical that the communities in which students live give credible support to children's nutrition. Community members can support children's nutritional health by being positive role models and promoting healthful food and beverage choices at community functions. Physicians and other healthcare providers can get involved by serving as resources for nutrition groups or policy-making organizations, participating at community health fairs, contributing and/or reviewing articles for local publications, and educating parent and community leaders on nutrition and health.

We encourage health professionals in Wisconsin to be actively involved in raising the awareness of families, schools, and communities regarding the importance of calcium in children's health.

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Teens today facing familiar problems

Physicians working to help young patients navigate landscape that includes depression, sex, eating disorders, alcohol & tobacco

By Marc Kennedy, special to WMJ

Most pediatricians and adolescent medicine specialists agree that the types of problems preteens and teenagers encounter have remained relatively constant in the last decade or so. But the incidence fluctuates somewhat, as evident in the 1999 Youth Risk Behavior Survey. This is a 96-question, anonymous survey by the state Department of Public Instruction (DPI) conducted last year of 1,336 students grade 9-12 at 46 Wisconsin public high schools.

The good news is that the majority of the state's students avoid risky behaviors. They report less violence and sexual activity, and despite incidents like Columbine, nearly 100

percent feel safe at school. The bad news is that they are more likely to drink heavily and use tobacco and marijuana than they were six years ago. And the percent of those who have considered suicide has remained about the same.

"There is a misperception that rural areas don't have the same problems that Milwaukee and other big cities have. Teen pregnancy can seem worse up here at times. Drugs are not absent. We don't see as much gun violence as in the inner city, perhaps, but we see a lot of injuries from car accidents."

James Meyer, MD

The survey showed the following changes from 1993:

- 34% reported binge drinking, compared to 29% in 1993;
- 22% use marijuana, up from 11%;
- 38% had used tobacco, up from 32%;
- 41% had had sexual intercourse, down from 47% in 1993;
- 96% felt safe in school, up from 94%;
- 11% reported fighting in school, down from 16%;
- 6% said they had brought weapons to school, down from 9%;
- 28% said they have considered suicide, up slightly from 27%.

Four Wisconsin pediatricians discuss their views on some of the issues that most trouble adolescents and teenagers today, and how to address them.

Mental Health

Although the Youth Risk Survey reveals that the numbers of students that have considered suicide remains fairly constant, that number (28%) is surely cause for concern.

"One of my big concerns is mental health," said Catherine Slota-Varma, MD, president-elect for the Medical Society of Milwaukee County and immediate past chief of staff at Children's Hospital in Milwaukee. "In my 21 years in pediatrics, I've seen a lot of dysfunctional family situations. And it's these kids I find I have to spend more time with. There are more divorced and remarried families, with kids who get stuck in the middle and whose parents use them like ammunition. The kids are dealing with a lot of issues and need to talk to somebody; in these cases family members are not in that position."

In addition to family problems, lack of self worth is frequently at the root of depression that plagues many young people.

"We try to be positive when talking about their body and how they are perceived by others," said Steven C. Matson, MD, founder and Medical Director of the Milwaukee Adolescent Health Program. "We try to increase self worth. We tell them how well they are doing. Give them positive reinforcement. Again a lot of what we do is to try to sift what are normal feelings of low self-esteem from suicidal thinking. When we find a patient who is depressed, we ask a simple screening question: 'Have you ever thought of hurting yourself?' We know a lot of kids have tried or have thought about it. They are in higher risk group for suicide. We need to be monitoring their progress, screening them all the time. It's important to hit that aspect of depression right away anytime we see it."

Eating Disorders and Overweight

Often there is a link between depression and body image, which can lead to other serious health issues like eating disorders.

"For some girls, it has to do with how they see their body, how they see themselves against TV, magazines, and billboards," said Slota-Varma. "Kids are made to think they need to fit a certain image. This leads to anorexia in some teens, so we need to address both the nutritional as well as psychiatric aspects of depression."

"Adolescent eating disorder-related problems are huge," said Slota-Varma. "When I suspect a kid may be anorexic, I ask them if they think they need to lose more weight, and if they want to throw up after eating what they think is too much. Kids are pretty savvy. Even the 10-year-olds understand what I'm talking about."

Then there is the flipside to anorexia — perhaps a more long-term and ingrained behavioral problem: obesity.

"A lot of behaviors have already been laid down by family by the time we see many of the older kids," said Matson. "We see a distinct patient population, from the central city in Milwaukee. They have gotten in the habit of eating poorly without regular exercise. Many of the kids I see are at risk for eating too much fast food, getting way too much fried fat. I have to admit there are often many other more pressing problems with many of these kids.

"I try to sift through it all and help those who are reachable. In some cases we are getting onset of adult diabetes in these kids, so it is an important issue," added Matson. "We try to work with them to be happy with who they are and how they look at that point. Many of them want to lose weight, and often try hard to do it. But in some of their neighborhoods, outdoor activities are hard to find and many areas aren't safe. And if there isn't a Boys and Girls Club nearby, it's hard to find a place to exercise in cold weather."

Obviously, though, the problem isn't one exclusive to urban teens.

Over-eating and improper diet go hand-in-hand for too many contemporary families.

"This comes from the many families whose parents are both working, if there are two in the home," said Madison pediatrician Sandra Osborn, MD, past president of the SMS. "They end up relying so much on fast food, and there is often little supervision over what kids eat. Some go to McDonalds for breakfast, lunch and dinner, and rarely get that home-cooked meal 'like mom used to make.'

"And there is too much television and video games, where the kids are just sitting around," Osborn continued. "What I'm concerned about is the isolation that we're creating with the ability to work and play at home with a computer and not interact with people. Kids go online at an early age, and have virtual experiences. I worry that some don't develop the ability to communicate with real people and interact with them. Kids growing up now are whizzes at this stuff. That's great for computer awareness, but too much time spent in front of the computer impedes socializing with other people, limits time for exercise and is bad for weight control."

Sexuality

"We have an 11-year-old girl with a child," Slota-Varma said of one of her patients. "Unbelievable. I start talking to kids at age 10 about sex. I start with body change and development then discuss AIDS and pregnancy protection. I don't know if I get 100 percent honesty but these are things that we have to talk about."

While the number of teens reporting that they are sexually active has declined 6 percent, according to the DPI survey, sexuality is still a big topic for physicians and their pre-teen and teenage patients.

"It is very common for kids who are sexually active not to be practicing any prevention," Matson said. "Part of our job is to educate them. And we advocate abstinence. There is a program run for 7th graders in Milwaukee that promotes abstinence and understanding of sexual responsibility and control over their own bodies by looking at multiple factors. This is great for kids who choose it. But many will not, and we'll want them to avoid pregnancy and sexually transmitted diseases."

Sometimes, Matson gets too personal for some young patients' liking, but he is committed to keeping them informed and encouraging them to be responsible.

"Every once in a while a kid thinks you are getting too nosy," he admitted. "But if they are not comfortable with our system of care, they will seek someone else. It's our style, and we talk it over with parents to let them know the types of things we'll be talking about with the kids.

But talking to young patients about sexuality can go beyond birth control and STDs.

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"One hot issue we face is younger girls dating adult males," he said. "We have taken a stance of strong opposition to this. When it's a 13-year-old girl who is sexually active with a 20-year-old male, we regard this as statutory rape. We see it as child abuse, and in Wisconsin, this is a felony.

"We're trying to get providers to take a good sexual history for pre-teen and early teen girls, and find out who they are with. We are strong proponents of contraceptives, and we try to support kids to help make them make good decisions. But we also feel strongly about young girls being taken advantage of by an older man."

If there is anything new in her repertoire of discussions concerning sex, Slota-Varma says it's the issue of homosexuality.

"One thing that we should talk about more is gender issues with kids, same sex versus opposite sex," she said. "It's an issue that if you open the door, maybe they will talk to you the next time. If they are hiding something, they can get very depressed. So I try to raise it delicately. But I've never had a kid get upset. They like it better if we discuss their issues."

Tobacco and Drugs

Addressing drinking and drug and tobacco use is standard operating procedure for most pediatricians and adolescent specialists.

"I always touch on smoking with my kids," said Slota-Varma. " Do they smoke, do members of their families smoke, are they aware of the problems related to smoking."

It's obviously an important topic, since teens surveyed report a 6 percent increase in tobacco use. Binge drinking and marijuana use have also escalated.

"Today I get more kids to answer me honestly about smoking than drugs or alcohol," Slota-Varma said. "I tell them that I don't know if the answer they are giving me is correct but I'm giving them the chance to discuss it. We need to take every opportunity to raise their awareness of the consequences of their actions. It's a good idea to raise it at middle school level. I certainly let them know that I am not going to skirt these issues."

Violence

"One issue the American Academy of Pediatrics is addressing is firearms and violence," said Slota-Varma. "I've started focusing on this more as well. Are the guns available in the household? What are kids bringing to school? There have been worried parents, teachers and kids with all that happened last year at Columbine. Kids are aware of this and are worried about the possibilities of it happening in their school. And, it can happen anywhere. These fears are not unfounded. But gun access in the home also deals with the whole issue of violence."

"The issue of firearms and violence is a tough one," Matson agreed. "It's of those things that many of my kids have grown up

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with coming from the inner city. So many kids are involved in gangs; it is so much a part of their lives. We try to couch our advice in terms of their personal safety and of their responsibility to themselves and to others. Many also won't share information about their affiliations. We try to talk with them about the danger it puts them in. This they understand, because they have seen what happens to their friends.

"In some cases we try to make mental health connections when kids are extremely violent, or mildly retarded, or angry. We can try to get them counseling or medication, whatever is appropriate. There are programs we can refer some of them to. Also, there is an anti-violence program involving Milwaukee medical and community associations called 'Project Ujima'."

Ujima began in 1995 as a community effort to stop the cycle of violent crimes by reducing repeat victims of violence. It is a collaboration of Children's Hospital of Wisconsin, Medical College of Wisconsin, Social Development Commission, Family Service of Milwaukee and the City of Milwaukee Health Department. Violent injuries are associated with psychological trauma, poor school performance, criminal detention and repeat incidents of violence. Project Ujima establishes a service network providing physical, psychological and social recovery from violence.

Urban violence does not seem to elicit much surprise. However, small-town Wisconsin is not without its own troubles.

"There is a misperception that rural areas don't have the same problems that Milwaukee and other big cities have," said James Meyer, MD, an Adolescent Medicine Specialist at the Marshfield Clinic. "Teen pregnancy can seem worse up here at times. Drugs are not absent. Most kids can tell you that they can get them if they want them. We don't see as much gun violence as in the inner city, perhaps, but we see a lot of injuries from car accidents. Nearly every kid has a car due to the long distances between job, school and home. In addition, there are farm accidents, along with four-wheeler incidents."

Like his urban counterparts, Meyer tries to reach out to the rural Wisconsin community.

"We go out to schools to lecture. We hold conferences here at the medical complex in Marshfield for high schools in spring and fall. We discuss STDs, pregnancy, birth control, and the consequences of each. We present some harsh reality material concerning labor and delivery, and give the kids chances to ask questions."

Substance abuse, irresponsible sexual behavior and other risk taking behaviors will likely remain part of the landscape of challenges facing teens in the foreseeable future, but with an open dialogue between physicians and their young patients, perhaps the next Youth Risk Behavior Survey will yield better results.

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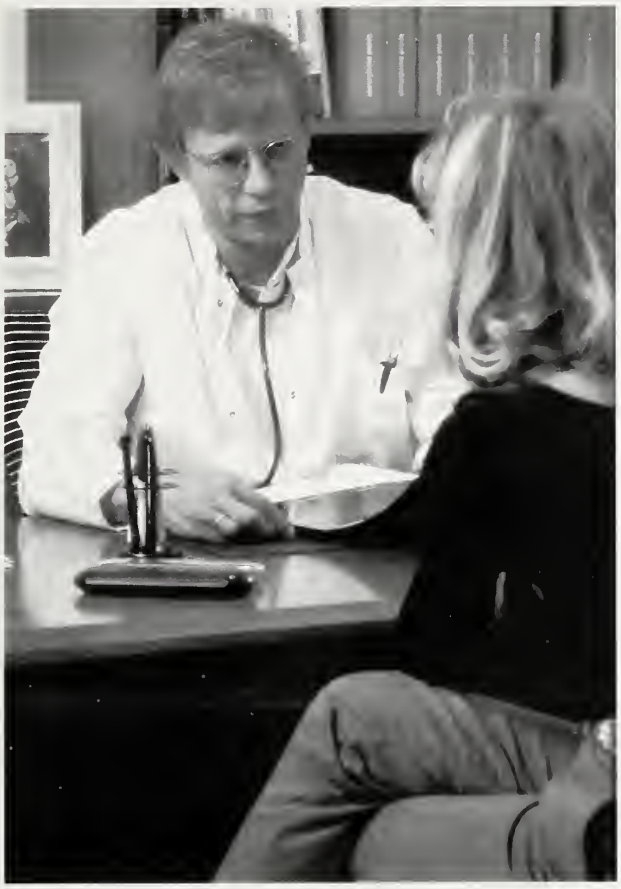

In Doc We Trust

Building rapport with young patients takes time and skill

By Marc Kennedy, special to WMJ

Drugs. Alcohol. Tobacco. Sex. Depression. Eating disorders. Parents and teachers often lament that their adolescent children and students won't talk to them about these personal issues and the potential dangers involved. But there is one adult to whom many kids are more likely to confide: their physician.

This rapport is not automatic; it is something that pediatricians and adolescent medicine specialists say that they have to earn.

"Give the kids enough time," said Sandra Osborn, MD, a Madison pediatrician and past president of the State Medical Society of Wisconsin. "You are not going to get anywhere if you walk into the room and say 'OK now, what are the problems?' Kids are going to say everything is fine and not say anything about what is really bothering them. They have to trust you, and that takes time. One of the problems today is the way medical care and HMOs are trying to make everything fit into a nice, neat little time slot. But reality just doesn't work that way."

Establishing rapport with an adolescent

patient demands more than a cursory glance at a chart or a quick fix prescription for an acute ailment. This might suit an adult who is comfortable with discussing intimate medical details, but young people are less likely to be as forthcoming.

"I've decided to make that commitment, to spend the time necessary with the kids I see," said Catherine Slota-Varma, MD, a pediatrician at Children's Hospital of Wisconsin. "This approach really helps. I think you have to spend the time, pay attention, let them talk, and respect their opinions."

"It's a tough world out there. Even for kids who are doing well, are in an intact family and don't have any obvious problems... At this age, all kids have a lot of potential; you want to encourage that and help make them as safe as possible."

Catherine Slota-Varma, MD

Most kids can tell when someone is on the level, or insincere.

"Teens are as good as anyone at spotting a faker," said Steven C. Matson, MD, associate professor of pediatrics at the Medical College of Wisconsin, and founder and medical director of the Milwaukee Adolescent Health Program. "So to be able to gain the trust they need to find out what is really going on with an individual kid, physicians know overtures they make need to be up front, honest and non-judgmental."

And, Slota-Varma pointed out, physicians have to be willing to hear that some of their adolescent patients have been involved in risky behavior.

"It's best not to have your head in the sand," she said, "we have to acknowledge that this age group is going to experiment. But try not to be judgmental, and let them know that you really are concerned about their health."

Matson concurred.

"We can't be too surprised when about 90 percent of kids try alcohol by the time they are 18 and about 30 percent have tried marijuana," he said. "Our job is to look at how their lives are going. Are the kids having deeper problems that are affecting their ability to function? Are they starting to show signs of trouble in school, at work, in relationships, with their mental health in general?"

If it sounds similar to delicate diplomatic negotiations, it's because the analogy fits.

"The whole idea is to build rapport," said Matson. "You just don't do it by asking the parent or guardian to leave the room and then asking the kid about sex. You need to get more involved. You need to ask questions that will tell you who they are and what they like, who their friends are. Sometimes I'll put down the pen and chart and just talk for awhile. Be true and interested in them, but don't rush them. As much as they can be in a hurry at times, it's a hard age to rush when it comes to them personally."

Time, Trust and Respect

Pediatricians who have seen patients routinely over the course of their lives, or at least over several years of their lives, can monitor the child's progress as he or she enters puberty. They can get to know the boy or girl and have a frame of reference regarding medical history, family situation and other concomitant variables. But this information is frequently a luxury for Matson, who primarily sees inner city youth from what is euphemistically regarded as economically diverse neighborhoods.

"Our experiences do not always relate to a busy pediatric practice in suburbia. We see a lot of high-risk kids, many for the first time. Many of them we have to try to win over in a single visit. We never know when they may be coming back."

Without the background medical information, Matson and his colleagues at the eight clinical sites throughout Milwaukee focus on an alternative strategy.

"We take a public health approach, attempting to help kids out at the point where they are at the moment," Matson said. "If you try to fix everything, you get disappointed. So we concentrate on helping kids with what they need today, and work from there."

Matson said he begins speaking frankly to adolescents at a key time in their development, usually around age 12, and makes sure that he can spend some time alone with them.

"Naturally, that tends to be around puberty. I try to help them feel comfortable being alone with me, without a parent or guardian," he added. "I try to establish the limits of confidentiality when it comes to sensitive issues. The way we couch it is placing the responsibility with the youngster. I let them know that almost anything we talk about is between us—if they are mature enough to take care of it if there are issues to deal with."

Matson is clear about the stipulations.

"If they talk about hurting themselves or other people, we draw the line," he said. "Kids understand that we are going to act in their best interests. We explain this, such as in cases of abuse. We would have to break the bond of

confidentiality, but we let the kids know that up front."

Surveys and Other Strategies

As it is unlikely for most adolescents to routinely be forthcoming with personal information, pediatricians develop their own system to ensure they touch all the appropriate bases.

"I have a cookbook list that I go through," said Sandra Osborn. "My nurses do certain parts of it. I'll follow up with additional questions. I look for clues about how they are doing since the last time I saw them. I review weight, height, body size and kind of try to figure out if they are getting the right amount of exercise and proper diet. I don't always ask about alcohol, but I always ask about smoking.

"I prefer when they come for an exam that they try to have a parent in the room so the parent can voice concerns," she said. "Kids often forget or don't want to mention issues, and sometimes parents don't raise issues when I talk with them, but when both are there they remind each other.

"Of course, I spend time with kids by themselves to discuss things they don't want to say in front of the parents," said Osborn. "Sometimes I don't think they know how to talk about it. If you look at the kid and read his or her face, sometimes you can pick up on depression, anxiety. That gives you an opening to say something like 'you look like you feel sad. Is there something going on I should know about'? If you give them a chance then, and let them know you want to hear what they have to say, maybe they'll talk later. I've got a couple of kids whom I've told I'd be glad to see later if they want to talk about anything. I tell them to say they have a cold or a headache and make an appointment and come in so we can talk."

Matson relies on a simple acronym when dealing with his young patients.

"We have a patient interaction form that guides how we see a patient," he said. "And we rely on a reminder code we call a 'HEADSS' review: Home, Education, Activities, Drugs, Sex and Suicide. As a faculty member of the Medical College, we often see patients accompanied by a resident. It's a handy teaching tool that helps as a reminder, especially when we see a new patient, which we often do."

Matson has found that one problem is usually not an isolated situation; a risk-taking action usually indicates other problems.

"We look for risky behaviors, which often go hand-in-hand. Substance abuse, for example, usually means the kid is probably active sexually and is not acting responsibly to prevent STDs or pregnancy. After we've done enough rapport building, we come right out and ask them. Most kids are truthful."

James Meyer, MD, an Adolescent Medicine Specialist at the Marshfield Clinic, said he tries to take a holistic approach to treating pre-teens and teenagers.

"I tell them that I'm here to be their coach for a healthy lifestyle," said Meyer, who attempts to point out the consequences of their actions. "I try to explain that they won't feel well or perform well if they don't eat the right foods or drink the right amount of proper liquids. Some kids are literally getting dizzy and passing out because their blood sugar is too low. Also I talk about the importance of getting enough exercise and getting enough sleep."

There is also a touch of real-world pragmatism in how Meyer communicates with his young patients.

"We try to help kids manage stress, and often we see that their families are stressed as well," he said. "We talk about drug abuse, teen pregnancy, depression, suicidal behavior; all are manifestations of stress not being dealt with. Kids need to know that every day is not going to be perfect; that the hard things that you endure make you stronger, wiser; more mature. They need to realize that sometimes they have to figure out for themselves how to make situations better. That's part of growing up. But if you don't know how, you need support and some guidance. Hopefully they can turn to parents, but often they can't."

That's why the physicians feel they need to be approachable.

"Often kids will look to siblings and friends for advice," Meyer added. "While their intentions may be good, they have limited life experiences as well, and are often misinformed. So I let my patients know that they can talk to me about anything. I won't try to judge them or try to make them feel bad about it."

Strategies for Dealing with Issues

Once they have gained their patients' trust, what do physicians do once the kids are honest with them?

When a physician finds that the patient has been experimenting with substances or is engaging in risky behavior, he or she will need to handle the information with the same diplomacy that helped them establish the relationship.

"I ask them if they think there are consequences to what they are doing," Meyer said. "A lot of kids who use pot and booze don't see a consequence. If they can't say no whenever they are around marijuana or alcohol, I tell them that we have a problem. They start relying on drugs or booze whenever they are confronted with a problem. Then they are not getting done what they need to get done: homework, their jobs if they have one. They start losing sleep, have no energy, and don't feel well. The kids may say 'well, I'm smoking or drinking but I'm still doing well,' but their coach or teacher would say something different."

Meyer said he tries to identify the symptoms and tie them with

risky behavior and then to the consequences and let the youths fill in the blanks concerning the action they should take.

"When one of my kids who smokes comes in with a cold or sore throat, I ask them if they think there is a link with smoking," he said, adding that most kids will agree that smoking makes it worse. "I tell them quitting is an option. But it's up to them. We can support them, along with friends, parents, others who can help. I also try to show them additional consequences: the expense; it ruins their clothes, and they could probably come up with better ways to spend their money."

A key to the smoking argument is to play the "control" card, according to Meyer. Teens want to feel that they are in control of their lives — not parents, teachers, coaches or anyone else.

"I say to young smokers all the time that tobacco companies love to get their money," said Meyer. "They don't want you to quit. They don't think you can quit. 'You're not in control', I tell those kids, 'the tobacco companies are.' Kids don't like the sound of that." When a serious issue arises that Meyer believes parents should know about, he does not want to breech the confidential bond. Instead, he will use the trust he has developed with the patient to get the youth to agree to involve them.

"I try to get them to see the value of letting the parents know," he said. "I'll bring it up, but I let them decide to bring the parents in."

Often parents are shocked by such revelations.

"Many do not have a clue," Meyer said. "The parents' perception of risks their kids are taking based on what their teens tell them and what they actually do is frequently quite dramatic. One study showed that parents were right only 30% of the time when it comes to reality about what their kids are doing or have done. Sometimes they want the caregiver to be a spy, but I refuse. If I play that role, I will lose the teen's trust. You have to get them to trust you, otherwise they won't discuss the serious issues of drugs, alcohol and sex."

Discerning when to ask leading questions which slowly reveal personal issues, and when to be more straightforward can require a delicate balance.

"Don't be afraid to direct questions," said Slota-Varma, if intuitively something seems wrong. "If you think about it, you should ask it. Nobody has said to me 'how dare you ask this' yet.

"When girls come in with abdominal pain, I always speak in carefully coded language to see if there is any sexual abuse occurring. If there is any doubt in the parents' answer, I speak with the girl alone. Even though this is very sensitive, I find they don't mind if you ask correctly."

And just having information available to teens in the office can have a positive effect as well.

"We have all kinds of informational pamphlets, booklets, fact sheets, whatever, all over the office," Slota-Varma said. "HIV, hepatitis B, smoking, drugs, alcohol, all of the big issues. The kids may not have it, but most are worried about it. And even if they don't mention it in the exam room, they at least get their hands on the correct medical information."

Above all, the physicians need to convince their adolescent and teenage patients that they are on their side and understand life at that age can be overwhelming.

"It's a tough world out there," said Slota-Varma. "Even for kids who are doing well, are in an intact family and don't have any obvious problems. We may spoil them, and we want them to have opportunities. We need to encourage all of them, and support them in their plans for the future, their hopes and dreams. At this age, all kids have a lot of potential; you want to encourage that and help make them as safe as possible."

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Newborn Screening in Wisconsin: Program Overview and Test Addition

Jill Bork Ciske, MS, Gary Hoffman, Kristine Hanson, MS, Kendall Mockridge Annable, MS, Jon Wolff, MD, Tom Litsheim, Ronald Laessig, PhD, and Richard Aronson, MD, MPH

ABSTRACT

The prevention of congenital anomalies and their sequelae is an important public health objective. One strategy for preventing morbidity and mortality due to congenital disorders is Wisconsin's Newborn Screening Program. Wisconsin has been a national leader in newborn screening since its inception with phenylketonuria screening in 1966. Wisconsin's program is a collaborative effort of the State Maternal and Child Health Program, housed within the Division of Public Health of the Department of Health and Family Services; the State Laboratory of Hygiene; physicians and other health professionals; and families. After in-depth consideration, the Department recently approved the addition of 14 fatty acid oxidation disorders and organic acidemias. This paper provides an overview of the Newborn Screening Program and introduces the disorders that Wisconsin added to the newborn screening panel in April 2000. Technologic advances have provided Wisconsin with yet another tool to improve the health of its citizens and prevent significant morbidity and mortality.

OVERVIEW OF WISCONSIN NEWBORN SCREENING AS A PUBLIC HEALTH PROGRAM

The prevention of congenital anomalies is an important public health objective identified in *Healthier People in Wisconsin: A Public Health Agenda for the Year 2000*[1] and in the comparable plan for the nation as a whole, *Healthy People 2000.*[2] Efforts to prevent congenital anomalies and their sequelae, which together account for more than 17% of post-neonatal deaths, require a broad and multi-faceted public health approach.[3]

One central strategy for preventing morbidity and mortality due to certain congenital disorders in Wisconsin is the state's Newborn Screening Program. Newborn screening is widely recognized as a core public health program. The development of the Guthrie Test for phenylketonuria (PKU) in 1963 and nationwide implementation of PKU newborn screening programs by 1966 constituted landmark achievements in maternal and child health. The Wisconsin legislature passed a statute governing newborn screening policy in 1966. In 1978, amendments to the original legislation added screens for other disorders in addition to PKU. Currently, Wisconsin screens for the following disorders: biotinidase deficiency, congenital adrenal hyperplasia, congenital hypothyroidism, cystic fibrosis, galactosemia, hemoglobinopathies, phenylketonuria, and the recently-added 14 organic acidemia and fatty acid oxidation disorders.

Early diagnosis of the disorders identified by newborn screening can lead to early treatment and prevent or minimize significant morbidity and mortality. In fact, since 1978, the program has screened 1.5 million Wisconsin citizens at birth and prevented mental retardation, severe medical complications, and, in some instances death, in more than 1000 children.

Wisconsin law requires that all infants born in the state are screened for the specified congenital disorders either before they are discharged from the hospital of birth or by the first week of life, if born outside of a hospital. Of the 67,379 Wisconsin live births reported in 1998, 99.7% of babies received newborn screening. This exceeded the *Healthy People 2000* objective of 95% newborns screened.

Wisconsin's Newborn Screening Program is a collaborative effort of the State Maternal and Child Health Program, housed within the Division of Public Health of the Wisconsin Department of Health and Family Services; the State Laboratory of Hygiene; physicians and other health professionals throughout the state; and families. When the State Laboratory of

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Hygiene identifies an infant with a positive newborn screen, it makes every effort to assure that proper follow-up testing occurs. In most cases, this follow-up involves contact between the State Laboratory and the baby's physician. If the infant is diagnosed with a congenital disorder, the primary care physician and appropriate medical specialists collaborate to assure that the infant receives appropriate comprehensive treatment.

Fortunately, most babies receive normal newborn screening results (95.5% in 1998). When an abnormal result is identified and reported to the infant's physician by the Newborn Screening Laboratory, the follow-up system is put into action. Follow-up activities can be relatively simple, such as the submission of a repeat specimen to the Newborn Screening Laboratory. In more complex cases, a multidisciplinary team of individuals involved with the Newborn Screening Program coordinates efforts to obtain follow-up specimens. Local public health departments play a key role by locating babies and their families who may, for a variety of reasons, have limited access to medical services.

The Department of Health and Family Services has primary responsibility for directing the Newborn Screening Program. In 1990, the Department created the Newborn Screening Advisory Group. The Newborn Screening Advisory Group is comprised of laboratory experts, parents of affected children, primary medical care providers, specialty medical care providers, nutritionists, genetic counselors, public health professionals, and others involved in the identification and care of infants with congenital disorders. Most of the physician and parent members generously volunteer their time and expertise. The group meets twice yearly to review and evaluate the Newborn Screening Program. The chair of the Newborn Screening Advisory Group is the Chief Medical Officer for Maternal and Child Health at the Division of Public Health. He reports the group's concerns and recommendations to the Secretary of the Department of Health and Family Services via the State Health Officer.

There are six subcommittees of the Newborn Screening Advisory Group. The majority of the members of these subcommittees also are volunteers. These subcommittees address issues of state and national concern such as establishing appropriate screening cut-offs to maximize sensitivity and specificity, developing protocols to ensure appropriate follow-up care after diagnosis, and evaluating laboratory and clinical protocols to assure an efficient and beneficial program.[4]

Four of these subcommittees (endocrine, hemoglobinopathy, metabolic, and molecular) address issues directly related to the conditions identified by the newborn screen. The work of the education subcommittee is to promote knowledge regarding newborn screening issues to Wisconsin health care providers and citizens. The addition/deletion subcommittee is convened when new information becomes available that deems consideration of the addition or deletion of a disorder to the newborn screen.

In 1996, the Newborn Screening Program began considering the addition to the newborn screening panel of a test for organic acidemias and fatty acid oxidation disorders. In 1998, after in-depth consideration by the addition/deletion subcommittee and the recommendation of the Newborn Screening Advisory Group, the Department approved the addition of these 14 organic acidemias and fatty acid oxidation disorders.

FATTY ACID OXIDATION DISORDERS AND ORGANIC ACIDEMIAS

Fatty acid oxidation disorders are a class of inherited errors of metabolism caused by an enzyme defect in the fatty acid metabolic pathway. Fatty acid metabolism takes place in the mitochondria of the cell where a series of enzymes transfer fatty acids across the inner and outer membranes of the mitochondria. Carnitine is required for the transfer of fatty acids across the inner membrane by carnitine palmitoyl transferase. Once inside the mitochondrial matrix, fatty acid chains are oxidized and broken down to release energy by another series of enzymes. Any defect of the enzyme(s) in the pathway or a deficiency of carnitine can lead to a build-up of fatty acid metabolites and cause toxicity.

The most prevalent of the fatty acid oxidation disorders is Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCAD), a disorder of fat metabolism which is estimated to affect approximately 1/10,000 newborns in the United States. Children born with MCAD typically appear well at birth, but can develop life-threatening hypoglycemia following minor illness or a period of fasting. Symptoms include hypotonia, lethargy, and vomiting; the hypoglycemia can lead to coma, encephalopathy, hepatic failure, or death. Twenty percent to 60% of affected children die as a result of their first metabolic crisis.[5] Those who survive their first crisis are at high risk to develop global developmental delay, Attention Deficit Disorder, speech and language delay, hypotonia, seizures, cerebral palsy, chronic headaches, chronic abdominal pain, and failure to thrive.[6] Effective treatment for MCAD exists, and includes instituting a low-fat diet and supplementing the diet with the prescription drug carnitine. Acute episodes are managed by administering intravenous glucose. Identification of affected infants prior to any metabolic crisis will allow for commencement of appropriate therapy and management of acute crises to prevent both morbidity and mortality.

In addition to MCAD, the screen detects six other fatty acid oxidation disorders, including Long Chain 3-

Table 1. Clinical presentation and treatment of the fatty acid oxidation disorders and organic acidemias added to the newborn screening panel.

Disorder	Clinical Presentation/Major Features	Treatment
MCAD	Reye-like episode: vomiting, lethargy, encephalopathy, hepatomegaly, seizures, coma, and death	Low fat, high carbohydrate diet, carnitine, prompt treatment of crises
LCHAD	Reye-like episode associated with hypotonia and hypertrophic cardiomyopathy	Low fat formula, carnitine, medium chain triglyceride, prompt treatment of crises
VLCAD	Metabolic crisis: vomiting, lethargy, hypotonia, cardiomegaly, encephalopathy, hepatic failure coma, and death	Low fat formula, carnitine, medium chain triglyceride, prompt treatment of crises
SCAD	Metabolic crisis, encephalopathy, cardiomyopathy, failure to thrive, hypotonia, hepatomegaly, coma, seizures, and death	Low fat, high carbohydrate diet, carnitine, riboflavin, prompt treatment of crises
GAII	+/- major congenital anomalies, hypotonia, hypoglycemia, acidosis, sweaty foot odor, hepatomegaly	Low fat and low protein diet, carnitine, riboflavin, prompt treatment of crises
CPTII	Hypoketotic hypoglycemia, cardiomyopathy, hepatomuscular symptoms	Avoidance of fasting, prompt treatment of crises
2,4 Dienoyl CoA-reduct	Cardiac defect, hypotonia, microcephaly, failure to thrive, short trunk, arms and fingers	Low fat diet, carnitine, avoidance of fasting
Propionic Acidemia	Ketoacidosis, vomiting, encephalopathy, hypotonia, hepatomegaly, coma	Low protein diet, carnitine, avoidance of fasting
MMA	Metabolic crisis, lethargy, failure to thrive, dehydration, respiratory distress, hypotonia	Low protein diet, carnitine, cobalamin, avoidance of fasting
Isovaleric Acidemia	Ketoacidosis, vomiting, lethargy, coma	Leucine restricted diet, carnitine, glycine, avoidance of fasting
3-MCC	Reye-like episode: vomiting, lethargy, apnea, hypotonia, seizures, coma	Leucine restricted diet, carnitine, avoidance of fasting
ß -keto-thiolase	Metabolic acidosis, ketosis, vomiting, failure to thrive, diarrhea, coma	Dietary restriction of isoleucine, avoidance of fasting
GAI	Hypotonia, seizures, opisthotonos, loss of head control, tongue thrusting, dystonia	Protein avoidance, carnitine, riboflavin, avoidance of fasting
HMG	Reye-like episode: vomiting, lethargy, coma, seizures	Low fat and low protein diet, carnitine

Hydroxyacyl CoA Dehydrogenase Deficiency (LCHAD), Very Long Chain Acyl-CoA Dehydrogenase Deficiency (VLCAD), Short Chain Acyl-CoA Dehydrogenase Deficiency (SCAD), Carnitine Palmitoyl Transferase Deficiency Type II (CPT-II), Glutaric Acidemia Type II (GA-II), and 2,4-Dienoyl-CoA Reductase Deficiency. These disorders have presentations and treatments similar to MCAD (Table 1). Although individually less common than MCAD, the collective incidence of these six disorders exceeds 1/50,000, and is likely considerably higher.

Organic acidemias, which can also cause life-threatening illness in early infancy, are a group of inherited metabolic disorders that lead to accumulation of organic acids in biological fluids (i.e. blood and urine). This, in turn, produces disturbances in the acid-base balance and causes alterations in pathways of intermediary metabolism. These disorders can cause intoxication-like symptoms such as episodes of vomiting, metabolic acidosis, ketosis, dehydration, or coma (Table 1). Some patients may have hypoglycemia, lactic acidosis, or hyperammonemia. Chronic symptoms include recurrent vomiting, failure to thrive, hypotonia, and global developmental delay.[6] Symptoms can be diminished by restricting protein in the diet, and in some cases, supplementing with vitamins and/or carnitine. Organic acidemias detected by the screen include Propionic Acidemia (PA), Methylmalonic Acidemia (MMA), Isovaleric Acidemia (IVA), 3-Methylcrotonyl-CoA Carboxylase Deficiency (3-MCC), Mitochondrial Acetonacetyl-CoA Thiolase Deficiency (ß -Keto-Thiolase), 3-Hydroxy-3-Methylglutaryl-CoA Lyase Deficiency, and Glutaric Acidemia Type I (GA-I). Although individually rare, the cumulative incidence of these disorders approaches 1/10,000.

THE ADDITION OF FATTY ACID OXIDATION AND ORGANIC ACIDEMIAS TO THE NEWBORN SCREENING PANEL

An extensive review by the addition/deletion subcommittee, metabolic subcommittee, and Newborn Screening Advisory Group determined that as a group, these organic acidemias and fatty acid oxidation disorders met Wisconsin's established criteria for the addition of a new screening test.[7]

1. Incidence: The cumulative incidence of these disorders is estimated to be greater than 1/10,000, which exceeds the criterion of an incidence of at least 1/100,000.
2. Morbidity and mortality: Because each of these disorders, if untreated, can cause severe morbidity and even mortality, the organic acidemias and fatty acid oxidation disorders meet the criterion related to morbidity and mortality.
3. Potential for successful treatment: Effective treatment strategies exist for these disorders. The effectiveness of early dietary therapy in preventing morbidity and mortality has been most well documented for MCAD, and long term prognosis is very good.[5] Likewise, dietary and vitamin therapy for some of the organic acidemias such as PPA has also been shown effective.[8] Dietary therapy for other disorders, such as LCHAD, greatly improves many symptoms (i.e. hypoglycemia, hypotonia, hepatomegaly, cardiomyopathy, and lactic acidosis) but not others (i.e. peripheral neuropathy, pigmentary retinopathy or myoglobinuria).[9]
4. Laboratory feasibility: Due to recent advances, appropriate technology is available to screen a large population for these disorders.
5. Costs: The cost of screening, detection and treatment is estimated to be about $400,000/year. In the absence of newborn screening (i.e. treatment is begun after significant clinical symptoms and/or metabolic crisis present), it is estimated that clinical diagnosis and treatment for these 14 disorders costs about $900,000/year in Wisconsin. Therefore, about $500,000 annually will be saved by the medical community, insurance, and state programs upon the commencement of newborn screening for organic acidemias and fatty acid oxidation disorders.

NEW SCREENING TECHNOLOGY

The technology that has enabled screening for organic acidemias and fatty acid oxidation disorders utilizes tandem mass spectrometry to measure 31 acylcarnitine species in a single dried blood spot. The test requires no additional blood specimen because it is performed on the standard filter card submitted for newborn screening.

Acylcarnitines are formed by esterification of organic acids to the endogenous amino acid, carnitine. Elevations in particular organic acid(s) in the blood, as occurs in organic acidemias and fatty acid oxidation disorders, will result in the elevation of corresponding acylcarnitine species. Each organic acidemia and fatty acid oxidation disorder has a characteristic acylcarnitine profile or pattern. The acylcarnitine profiles facilitate accurate diagnosis by identifying the accumulation of specific intermediates at a metabolic block. Figure 1 illustrates the block in the metabolic pathway.

Figure 1. Classical Illustration of Disrupted Metabolic Pathway

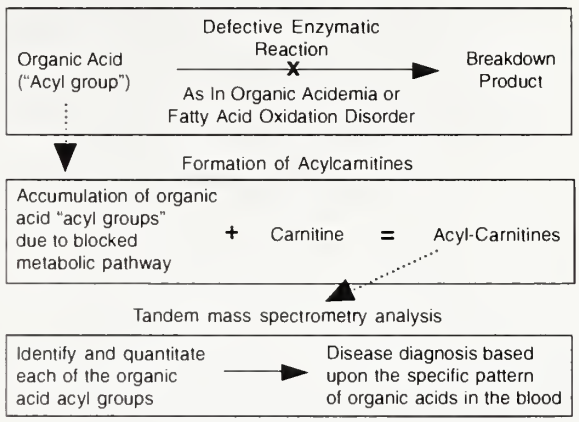

Table 2. Results of Pilot Testing

Disorder	Initial Positive Screens	Confirmed Diagnoses
MCAD	4	2
SCAD	1	1
GAII	1	0
PA	3	1*
3-MCC	1	0

* Initial sample was normal. A second sample was submitted due to a family history of PA. The second sample was abnormal. This case represents a mild form of PA.

At the Newborn Screening Laboratory, housed within the State Laboratory of Hygiene, data from the tandem mass spectrometer are fed into a computer which flags any specimen that has one or more acylcarnitine species registering four or more standard deviations above the mean. The acylcarnitine data from these samples are examined closely to determine if the acylcarnitine profile matches one of the 14 disorders included in the screen. Those samples that meet the criteria for a given disorder are reported to the infant's physician and to a consulting metabolic specialist. A repeat newborn screen and other specialized testing, varying by disorder, are required to confirm or rule out the diagnosis. The time between an initial positive screen and the completion of follow-up testing is usually 2 to 7 days.

Infants with a confirmed organic acidemia or fatty acid oxidation disorder are referred to a state-supported metabolic follow-up center. At the follow-up center, families are offered medical, nutritional, and genetic counseling services. In addition, the Division of Public Health provides any necessary specialized medical formulas, as it does for children with PKU.

ACYLCARNITINE SCREENING EXPERIENCE TO DATE

The State Laboratory of Hygiene has piloted acylcarnitine analysis since May, 1999. During this pilot phase, abnormal screens were reported to physicians, and follow-up testing was completed. Table 2 summarizes the number of positive initial screens by disorder, as well as the number of those screens that were confirmed as abnormal by follow-up testing. The table includes data collected from May to December, 1999. All of the children with confirmed diagnoses are healthy and have had no metabolic crises to date.

ROUTINE SCREENING FOR ORGANIC ACIDEMIA AND FATTY ACID OXIDATION DISORDERS

The Newborn Screening Program started routine reporting of the organic acidemias and fatty acid oxidation disorders in April 2000. Normal organic acidemias and fatty acid oxidation disorders screening results will be listed on the current normal newborn screening report as follows:

Disorder	Substance measured	Test	Result
Fatty Oxidation Disorders	Acylcarnitines	Profile	Normal
Organic Acidemias	Acylcarnitines	Profile	Normal

There will be two categories of abnormal acylcarnitine results. The first category will be those results that are highly indicative of an organic acidemia or fatty acid oxidation disorder. Such results will be reported directly to the baby's physician by a telephone call from a member of the Newborn Screening Laboratory staff. Recommendations regarding confirmatory testing will be given at this time as well as the name of a metabolic physician specialist who can provide assistance. In addition to the phone call, an abnormal laboratory report on gold paper will be sent to the infant's physician. The second category is the "borderline" test results, which the laboratory will report on blue paper. These results are those abnormal acylcarnitines that may not fit a typical organic acidemia or fatty acid oxidation disorder profile. The recommendation will often be to collect another newborn screening specimen and repeat the testing through the Newborn Screening Laboratory. Reports in either category (gold or blue) will list the results of the other newborn screening disorders.

SUMMARY

The addition of organic acidemias and fatty acid oxidation disorders to newborn screening in Wisconsin is another example of a public health program working to improve the health and well-being of Wisconsin citizens. The success, as always, depends upon the excellent working relationship of all the partners involved: the Department of Health and Family Services, State Laboratory of Hygiene, local public health workers, medical specialists, primary care physicians, and families. As one of the first states in the nation to add these disorders to its newborn screening panel, Wisconsin has demonstrated its continued commitment to a comprehensive Newborn Screening Program.

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Newborn Hearing Testing at Wisconsin Hospitals: A Review of the Need for Universal Screening

John Meurer, MD, MM, Marsha Malloy, RN, BSN, MBA, Marvin Kolb, MD, MS, Steven Subichin, MS, MBA, and Sharon Fleischfresser, MD, MPH

ABSTRACT

Every year, an estimated 200 babies are born in Wisconsin with hearing impairment. Early identification of hearing loss is associated with better language development. This study describes the prevalence of newborn hearing screening at Wisconsin hospitals. Ninety-six percent of all 107 acute care hospitals with newborn delivery services responded to a mailed survey. In 1997, 10% of newborns in Wisconsin had hearing tested. In 1997 and 1998, two and then seven hospitals, respectively, established universal hearing screening programs. Nurses performed hearing tests on most newborns using automated auditory brainstem response equipment. Universal newborn hearing screening can be done by nurses or other personnel at community hospitals prior to discharge.

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Every year, an estimated 200 babies are born in Wisconsin with severe hearing impairment. Permanent congenital hearing loss > 25 dBHL in the worst ear is present among at least 3 newborns per 1000, making it the most frequently occurring birth defect.[1]

The early identification of infants with hearing impairment is an important health objective. In a 1988 report to Congress and the President, the Commission on Education of the Deaf estimated that in the United States, the average age that children with congenital hearing loss were identified was 2½ to 3 years of age, with many children not being identified until 6 years of age. "If hearing impaired children are not identified early, it is difficult, if not impossible, for many of them to acquire the fundamental language, social, and cognitive skills that provide the foundation for later schooling and success in society."[2] The National Institutes of Health,[3] the Joint Committee on Infant Hearing,[4] the American Academy of Pediatrics,[5] and the American Speech-Language-Hearing Association[6] have all recommended that infants with hearing impairment be identified before 3 months of age and receive intervention by 6 months of age.

This study describes the prevalence of newborn hearing screening at Wisconsin hospitals in 1997. In this study, hearing screening is defined as an objective test using auditory diagnostic equipment to assess newborn hearing, rather than a subjective questionnaire to identify infants at high risk of hearing impairment. Because approximately one-half of infants with permanent congenital hearing loss do not exhibit any risk indicators, many children are missed by selective screens only of patients in neonatal intensive care units and/or questionnaires for all newborns.[7,8]

Several questions are answered in this study. First, how many and which Wisconsin hospitals screen newborns for hearing? Second, who performs the hearing test? Third, what test is used? Fourth, where are patients referred? The paper also reviews the evidence supporting universal newborn hearing screening and offers recommendations for implementing such programs.

METHODS

In July, 1998, a cover letter and postcard survey were mailed to the nursing or patient care executive at all 107 acute care hospitals with newborn delivery services located in Wisconsin. In October, a follow-up letter and survey were mailed to non-responding hospitals. In November, follow-up phone calls were made to non-responding hospital administrators. In November, the survey responses were confirmed for all hospitals that reported having either universal or selective newborn hearing screening programs.

Fifty-four percent of the surveyed hospitals were located in rural areas and 46% were in urban settings. Seventy-seven percent of the surveyed hospitals were non-teaching and 23% were teaching institutions. All of the hospitals were controlled by non-profit organizations.

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Table 1. Newborn Hearing Testing by Wisconsin Hospitals in 1997

Extent of newborn hearing screening done	No. of hospitals	Total No. of births	No. and % of newborns tested by type
Totals	103	62,570	6,120 (10%)
No hearing testing of newborns	91	41,156	0
Selective hearing testing of high risk newborns only	11	17,100	2,285 (13%)
Universal hearing testing of all newborns	2	4,314	3,835 (89%)*

*The percent of newborns tested was less than 100% because St. Luke's Memorial Hospital in Racine began a universal screening program in April, 1997.

The hospitals were asked the following seven questions regarding their activities with newborn hearing testing:

1. What number of newborns were admitted to your hospital in 1997?
2. Which newborns does your hospital test for hearing deficits – all newborns, high-risk newborns only, or no newborns tested?
3. Estimate the percent of all newborns who had a hearing test at your hospital in 1997.
4. What initial hearing test is used for most newborns – transient evoked otoacoustic emissions (TEOAE), automated auditory brainstem response (AABR), distortion product otoacoustic emissions (DPOAE), or no test used?
5. Who usually does the newborn hearing test (mark all that apply) – technician, audiologist, nurse, volunteer, or other?
6. Where does your hospital refer infants with abnormal hearing tests – own hospital, hospital in your health system/network, or another facility?
7. Who is the contact person at your hospital for newborn hearing tests – name, facility, title, phone, fax, and e-mail.

Hospitals reporting no newborn admissions in 1997 were excluded from the analysis. The data was studied using Statistical Analysis Software (SAS®). The total number of births at each hospital in 1997 was derived from the Wisconsin Center for Health Statistics provisional report. When the number of provisional births was missing for a hospital, the hospital executive's response to the first question in the hearing screening survey was used.

RESULTS

Out of 107 hospitals with newborns in Wisconsin, 103 (96%) responded to the survey. They collectively provided inpatient care for 62,570 newborns, representing 94% of all 66,490 births in 1997 provisionally reported by Wisconsin hospitals.

Most Wisconsin hospitals did not perform objective tests to screen for hearing impairment in newborns (Table 1). However, in 1998, at least 6 Wisconsin hospitals had established universal newborn hearing screening programs. In 1996, St. Mary's Hospital in Milwaukee established a universal screening program. In 1997, St. Luke's Memorial Hospital in Racine established a universal screening program. In 1998, Bay Area Medical Center in Marinette, Beaver Dam Community Hospital, Two Rivers Community Hospital, and Meriter Hospital in Madison established universal screening programs.

Nurses or nursing assistants performed hearing tests on most Wisconsin newborns who were screened in 1997 (Table 2). Audiologists or audiology technicians performed hearing tests in selective screening programs only. Therapists also performed hearing tests in a universal screening program.

Most hospitals used automated auditory brainstem response (AABR) equipment to test newborn hearing (Table 3). The vast majority of newborns screened in Wisconsin were initially tested by nurses, nursing assistants, or therapists using AABR equipment. However, transient otoacoustic emissions (TEOAE) equipment was used by audiologists or audiology technicians at two hospitals with selective screening programs.

Newborns with abnormal hearing tests at discharge were most often referred to the same hospital or its affiliated clinic, or to another facility for follow-up assessment (Table 4). In 1997, both hospitals with universal screening programs referred newborns with abnormal tests to the Children's Hospital of Wisconsin for final diagnostic evaluation.

DISCUSSION

In 1997 and 1998, 2 and then 6 Wisconsin hospitals, respectively, performed universal newborn hearing screening. Overall, about 10% of newborns in Wisconsin had their hearing objectively tested. In 1997, 65 infants enrolled in Wisconsin Birth to Three early intervention programs were reported as hearing impaired. In 1997, 354 children age 3 to 6 years were reported to the Wisconsin Department of Public Instruction as hearing impaired.

In the United States, the number of hospitals implementing universal newborn hearing screening has increased more than 30-fold in the last 5 years. Nonetheless, only about 20% of babies are born in hospitals with universal newborn hearing screening programs. More than 90% of all hospitals do not screen hearing prior to discharge.[1]

Table 2. Number of Hospitals and Newborns by Personnel Performing the Hearing Test in 1997

Personnel performing the hearing test	Selective screening		Universal screening		Totals
	Hospitals	Newborns tested	Hospitals	Newborns tested	Newborns tested
Nurses or nursing assistants	6	1,705	1	2,398	4,103 (67%)
Audiologists or audiology technicians	5	577			577 (10%)
Speech, occupational, or respiratory therapists			1	1,437	1,437 (23%)

Table 3. Number of Hospitals and Newborns by Method of Initial Hearing Test in 1997

Method of hearing test	Selective screening		Universal screening		Totals
	Hospitals	Newborns tested	Hospitals	Newborns tested	Newborns tested
Automated auditory brainstem emissions (AABR)	9	1,968	2	3,835	5,803 (95%)
Transient evoked otoacoustic emissions (TEOAE)	2	317			317 (5%)

Table 4. Number of Hospitals and Newborns by Referral Site for Infants with Abnormal Hearing Tests in 1997

Referral site	Selective screening		Universal screening		Totals
	Hospitals	Newborns tested	Hospitals	Newborns tested	Newborns tested
Own hospital or clinic	7	1,651	0	0	1,651 (27%)
Own health system or network	2	253	0	0	253 (4%)
Another facility	2	378	2	3,835	4,213 (69%)

Over 400 hospitals in 41 states operate universal newborn hearing screening programs.[1] Nine states (Colorado, Connecticut, Hawaii, Massachusetts, Mississippi, Rhode Island, Utah, Virginia, and West Virginia) have passed legislative mandates requiring hospitals to screen all newborns for hearing loss. Similar legislation was pending in nine other states (Arizona, Florida, Illinois, Maryland, Nebraska, Ohio, Oregon, Pennsylvania, and Washington). California has appropriated funding for newborn hearing screening and requires hospitals that receive Medicaid reimbursement to phase in these screening programs over 3 years. Statewide early hearing detection and intervention programs operate in four states (Hawaii, Mississippi, Rhode Island, and Utah), and 6 others are developing such statewide systems (Colorado, Connecticut, Iowa, New Mexico, West Virginia, and Wyoming).

This study is limited by the unconfirmed self-reports of hospitals. In addition, questions may have been misinterpreted by nursing executives or others completing the survey. For example, infants transferred from the hospital of birth to an intensive care unit at another facility may have been counted by both hospitals. Hospitals lacking objective screening programs were not asked if they reported newborns with risk factors for hearing impairment to the Wisconsin high-risk registry. This study did not measure the results of earlier versus later identification and intervention of hearing loss. It did not assess the prevalence or consequences of congenital hearing impairment. However, several of these issues have been studied by others.

REVIEW AND RECOMMENDATIONS

In 1993, a Consensus Panel convened by the National Institutes of Health concluded "that all infants should be screened for hearing impairment....This will be accomplished most efficiently by screening prior to discharge....Infants who fail...should have a comprehensive hearing evaluation no later than six months of age....When early identification and intervention occurs, hearing impaired children make dramatic progress, are more successful in school, and become more productive members of society."[3]

The cost for hospital-based universal newborn hearing screening is inexpensive and continues to decrease. Using current technology, the cost ranges between $10 and $60 per baby depending on the protocol and technology used.[1] The cost per child identified with congenital hearing loss is about one-tenth the cost per child identified with phenylketonuria, hypothy-

roidism, or sickle cell anemia in metabolic disorder screening programs.[9] Such metabolic disorder screening programs are required in every state.

Children with early identification of hearing loss and early intervention are associated with significantly better language development than children with later identified hearing impairment.[10] Approximately 10% to 20% of infants identified through newborn hearing screening have profound hearing impairment. By entry to first grade, children identified earlier are 1 to 2 years ahead of their later-identified peers in language, cognitive, and social skills. Infants with hearing loss can be fitted with amplification as young as 4 weeks of age. Hearing aids are the most commonly employed assistive device for sensorineural hearing impairment; however, cochlear implants and vibrotactile devices are important options in the intervention process. Behavioral treatment programs typically involve either home or clinic-based services to facilitate speech, language, and auditory skill development. With appropriate family-centered intervention, normal communicative, educational, and social development for hearing-impaired children is likely.

Many activities need to be addressed in implementing a universal newborn hearing screening, diagnosis, and treatment program.[11] Newborn screening with low false-positive rates can be achieved when audiology involvement, hospital support, and automated data and information management are present.[12] First, physicians, nurses, audiologists, speech therapists, and other authorities need to corroborate that newborn hearing screening is an evolving standard of care. Critical questions about financing and staffing screening programs must be answered. Equipment must be selected and an appropriate protocol determined for the individual hospital. Communication with parents, physicians, and hospital staff is essential. Staff must be trained in order to keep referral rates low. Patient information from screening programs should be managed through computer-based data systems that are coordinated with diagnostic centers and early intervention programs. Infants with abnormal screens should be tracked and referred to an established network of pediatric audiologists and other specialists with the capability to provide amplification and necessary follow-up.

Physicians and nurses can influence hospitals to invest resources in newborn hearing screening. Physician support is essential. Physicians who are members of the hospital medical staff committee that oversees implementation of new services for newborns must understand why newborn hearing screening is appropriate and necessary. Primary care physicians who provide medical home care for infants must be prepared to encourage follow up screening, when needed. Nurses who care for newborns must appreciate the benefits of testing hearing. Together these clinicians can educate hospital administrators about the cost-effectiveness of newborn hearing screening.

Both private and public sector partners are planning strategies for promoting, financing, implementing, and evaluating newborn hearing screening in Wisconsin. The ultimate goal of this statewide effort is to screen more than 95% of all babies for hearing loss in the birth hospital and to provide comprehensive, family-centered services for identified children and families. When the first well-appearing baby is identified with hearing impairment, the hospital nurses and staff, attending physicians, and, most importantly, the parents will deeply appreciate the value of universal newborn hearing screening.

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Evaluation of a Pregnancy Outcome Risk Reduction Program in a Local Health Department

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ABSTRACT

This study assesses the effectiveness of the Waukesha County Public Health Department's Prenatal Care Coordination Program (PNCC) in reducing self-reported risk factors for adverse pregnancy outcomes in pregnant clients, through assessment, preventive counseling and follow-up.

There were 166 clients seen in the program. They were seen at up to three follow-up visits, with 83 seen at the 12-week follow-up visit, 106 seen at the 24-week follow-up visit, 74 seen at the 38-week follow-up visit, and 151 seen for at least one follow-up visit. Statistically significant improvement was seen between the first and last follow-up visit for each of the five categories of risk factors that were assessed. Mean alcohol intake decreased from 9.6 drinks per month at baseline to none by the 38-week follow-up visit. Mean cigarette smoking decreased from 12.8 cigarettes per day to 2.4. Street drug use decreased almost completely. There were statistically significant increases in milk, meat, fruit, bread, and vegetable consumption, and folic acid and multi-vitamin supplementation.

INTRODUCTION

The Waukesha County Public Health Department (WCPHD) has had a long-standing Prenatal Care Coordination Program (PNCC), which provides prenatal counseling and supervision by public health nurses annually to approximately 121 low income, high-risk pregnant women residing in Waukesha County. In this program public health nurses assess risk factors for adverse pregnancy outcomes in clients, and then attempt to reduce these risks factors by preventive counseling and follow-up. In 1997, the WCPHD initiated a 17-month study to assess the effectiveness of its PNCC Program in reducing risk factors in pregnant women enrolled in this program.

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METHODS

Subject Identification and Enrollment

Subjects were referred from the Waukesha medical community to WCPHD's Prenatal Care Coordination Program. They were screened in the WIC clinic and in their homes for adverse pregnancy outcome risk using the State of Wisconsin Pregnancy Questionnaire.[1] Those subjects who were on medical assistance from the state of Wisconsin and who obtained a risk score on the questionnaire of 40 or more were enrolled in the PNCC Program and the study.

Of those participating, 85% of subjects were single, 84% were white, and 12% were Hispanic. Mean age was 21.7 years, with a range of 15 to 36. Mean PNCC score was 127, with a range of 40 to 502.

Data Collection/Prenatal Care Intervention

The WCPHD developed a standardized PNCC assessment tool to measure baseline risk behaviors and behavioral changes at specified pregnancy intervals. Behavioral data was systematically collected at 4 points: 3 months preconception and early pregnancy; 12 weeks (range 11 to 23 weeks); 24 weeks (range 24 to 36 weeks); and 38 weeks (range 37 to 40+ weeks).

Standardized prenatal behavioral health messages and materials, directed at measurable risk factors, were delivered and reinforced by public health nurses at specified intervals along the pregnancy continuum. These risk factors included poor nutrition, lack of supplemental vitamins and folic acid, alcohol and drug intake, and cigarette smoking.

Client reading level appropriate printed materials were given and reviewed on each visit. The effect of each of the behavioral risk factors on fetal outcome was discussed at each prenatal visit. Issues considered included the impact on fetal growth and birth weight, potential for brain/neurological impairment, congenital abnormalities, and fetal or neonatal death.

All significant findings were reported to the patient's primary source of medical care, which continued to follow these patients medically. Also, AODA counseling referrals were made where indicated.

STATISTICAL ANALYSIS

General Principles for Assessing Improvement in Risk Factors from Baseline

The general principle was to compare information

Table 1. Alcoholic Drinks Per Month by Gestational Age

	Gestational Age			
Alcoholic Drinks Per Month	3 Months Prior to Pregnancy	11-23 Weeks	23-25 Weeks	37+ Weeks
0	113	81	105	74
0-0.9	9	0	1	0
1-1.9	4	0	0	0
2-2.9	3	1	0	0
3-3.9	5	0	0	0
4-4.9	2	0	0	0
5-9.9	9	1	0	0
10-19.9	7	0	0	0
20+	14	0	0	0
Total Seen	166	83	106	74
Mean	9.6	0.08	.002	0.00

Table 2. Mean Alcoholic Drinks per Month at Baseline By Whether Seen in Clinic at Various Gestational Ages

Weeks Gestational Age	Seen In Clinic	Not Seen In Clinic	P Value
11-23	8.7	10.6	NS
23-25	8.0	12.4	NS
37+	10.6	8.8	NS

Note: There were 83 (out of the original 166) subjects seen in clinic at the first follow-up visit, 106 seen at the second follow-up visit, and 74 seen at the third follow-up visit.

Table 3. Cigarettes Smoked per Day by Gestational Age

	Gestational Age			
Cigarettes Per Day	3 Months Prior to Pregnancy	11-23 Weeks	23-25 Weeks	37+ Weeks
0	52	64	65	52
0-9	27	12	21	14
10-19	22	5	16	5
20	40	2	3	3
>20	25	0	1	0
Total Seen	166	83	106	74
Mean	12.8	1.43	3.42	2.39

Table 4. Mean Cigarettes Smoked per Day at Baseline By Whether Seen in Clinic at Various Gestational Ages

Weeks Gestational Age	Seen In Clinic	Not Seen In Clinic	P Value
11-23	12.8	12.9	NS
23-25	14.6	11.9	NS
37+	12.9	12.8	NS

Note: There were 83 (out of an original 166) subjects seen in clinic at the first follow-up visit, 106 seen at the second follow-up visit, and 74 seen at the third follow-up visit.

obtained at baseline against information obtained at the 12-week, 24-week, and 38-week prenatal visits, so as to assess whether or not there was statistically significant improvement from baseline. Baseline information pertained to the 3 months preceding conception until the first prenatal visit (or 11 weeks post conception, whichever occurred first). Information obtained at the prenatal visits pertained to current behavior. To be considered in the respective categories of prenatal visits a subject's visit must have occurred at 11 to 23 weeks gestational age, 23 to 25 weeks, and 37+ weeks, respectively. For categorical variables, the chi square test was used to assess statistically significant change from baseline, and for continuous variables the paired Student t-test was used.

Only subjects who attended clinics or were available for home visits at the designated periods were included in the respective analyses. To ascertain whether bias could have been introduced by selective dropping out of the program of high risk subjects, baseline information was statistically compared for those who continued in the program (as manifested by attendance at the prenatal clinics or home visits) versus those who dropped out.

Daily Nutritional Intake

The number of servings consumed per day was calculated for several different food groups as follows: milk group – one serving equals 1 cup milk, 8 ounces yogurt, or 1.5 to 2 ounces cheese; meat group – one serving \equals 2 to 3 ounces meat, poultry, or fish, one-half cup cooked dry beans, 2 tablespoons peanut butter, or 2 to 3 eggs; vegetable group – one serving equals one-half cup cooked vegetable, 1 cup leafy raw vegetable, or three-quarters cup juice; fruit group – one serving equals 1 medium whole fruit, one-half cup canned fruit, or three-quarters cup juice; bread group – one serving equals 1 slice bread, one-half cup cooked cereal, rice or pasta, or 1 ounce ready-to-eat cereal; fats and sugars – one serving equals 1 teaspoon. Change from last subsequent visit was calculated as the difference between the mean number of servings consumed per day at baseline and the last prenatal visit prior to delivery. The difference of this value from zero was assessed with the paired Student t-test.

Supplemental Vitamins

Prenatal vitamins were categorized as being taken 100% of days, 90% of days, 50% of days, 1% to 49% of days, or not at all. Folic acid was categorized as 2 mg per day, 1 mg per day, or none. The chi square test was used to assess statistically significant differences between baseline values versus the various prenatal visits.

Alcohol Intake

Total alcohol intake was calculated by adding the number of cans of beer, glasses of wine, and shots of

Table 5. Drug Use by Gestational Age

Drug	Gestational Age							
	3 Months Prior to Pregnancy		11-23 Weeks		23-25 Weeks		37+ Weeks	
Marijuana	28	(16.9%)	1	(1.2%)	1	(0.9%)	0	(0%)
Crack Cocaine	4	(2.4%)	1	(1.2%)	0	(0%)	0	(0%)
IV Cocaine	4	(2.4%)	1	(1.2%)	0	(0%)	0	(0%)
Any Inhalant Street Drug	33	(19.9%)	3	(3.6%)	1	(0.9%)	1	(1.4%)
Oral Ingestion of Any Street Drug	11	(6.6%)	0	(0%)	0	(0%)	0	(0%)
Any IV Street Drug	7	(4.2%)	0	(0%)	0	(0%)	0	(0%)
Any Over-the-Counter Drug	104	(62.7%)	34	(41.0%)	49	(46.2%)	30	(40.5%)
Decongestant	25	(15.1%)	5	(6.0%)	5	(4.7%)	7	(9.5%)
Pain Medication	91	(54.8%)	33	(39.8%)	40	(37.7%)	22	(29.7%)
Total Seen	166		83		106		74	

hard alcohol consumed on an average monthly basis. The number of drinks and frequency was recorded using a 12-ounce can of beer, 6-ounce glass of wine, or 1 shot of mixed drink or "on the rocks" as one drink. Binge drinking was assessed using 3 or more drinks at one sitting. This was compared for the information obtained at baseline with that obtained at the 12-week, 24-week, and 38-week prenatal visits, using the paired Student t-test.

Cigarette Smoking

Cigarette smoking was calculated as the average number of cigarettes smoked within a 24-hour period. This was compared for the information obtained at the 12-week, 24-week, and 38-week prenatal visits, using the paired Student t-test.

Drug Use

Drug use was assessed as a categorical variable (yes or no) for inhaled street drugs (marijuana, crack cocaine, glue, aerosols, white out, markers, and other), oral ingestion of street drugs, IV use of street drugs (cocaine, heroin, morphine, and other), and over-the-counter drug use (acetaminophen, decongestants, ibuprofen, cough syrup, aspirin, and other). Baseline information was compared against information obtained at the 12-week, 24-week, and 38-week prenatal visit, using the chi square test.

RESULTS

Alcohol Intake

Table 1 shows that 53 patients (31.9%) gave a history of at least some alcohol intake in the 3 months prior to pregnancy and that the mean alcohol intake was 9.6 drinks per month. By the time of the first prenatal visit, subsequent to the baseline assessment, alcohol intake was down to only a fraction of baseline values, with 2 patients reporting at least some current alcohol intake (2.5%), and mean alcohol intake 0.08 drinks per month.

Table 6. Food Consumption (mean # of servings per day) Baseline vs. Last Subsequent Prenatal Visits

Food Group	3 Months Prior to Pregnancy	Change by Last Subsequent Visit	P Value
Milk	2.56	+1.39	<.001
Meat	2.37	+0.27	.01
Fruit	2.31	+0.73	.002
Bread	4.37	+1.73	.007
Sugar	1.39	-0.17	NS
Vegetable	0.89	+0.58	<.001
Fat	1.82	-0.25	.07

By the time of the 38-week prenatal visit there was no reported alcohol intake in any of the 74 patients seen.

To assess whether the computed reduction in alcohol intake could have been due to the highest risk patients dropping out of the program, mean alcohol intake was computed by whether the patient was seen or not, at the 12-week, 24-week, and 38-week prenatal visit. Table 2 shows that there were no statistically significant differences in mean alcohol intake at baseline between those seen in clinic/home visits versus those not seen in clinic/home visits at any of the designated prenatal visits.

Cigarette Smoking

Table 3 shows that 114 patients (68.7%) gave a history of some cigarette smoking in the 3 months prior to pregnancy and that the mean cigarette use was 12.8 cigarettes per day. Mean cigarette smoking was greatly decreased by the 12 week prenatal visit (to 1.43 cigarettes per day). It rose to 3.42 cigarettes per day by the time of the 24-week prenatal visit, which was still significantly below baseline ($p<.001$). The mean decrease in cigarettes smoked per day of the 151 patients who were seen at least one prenatal visit after baseline was 10.4 cigarettes per day ($p<.001$).

Table 7. Supplemental Vitamin Use by Gestational Age

	Gestational Age							
Vitamin	3 Months Prior to Pregnancy		11-23 Weeks		23-25 Weeks		37+ Weeks	
Prenatal Vitamin								
100% of Time	43	(25.9%)	58	(69.9%)	71	(67.0%)	55	(74.3%)
90% of Time	7	(4.2%)	9	(10.8%)	15	(14.2%)	3	(4.1%)
50% of Time	3	(1.8%)	4	(4.8%)	5	(4.7%)	4	(5.4%)
1-49% of Time	3	(1.8%)	2	(2.4%)	1	(0.9%)	2	(2.7%)
None	110	(66.3%)	10	(12.0%)	14	(9.4%)	10	(13.5%)
Folic Acid								
2 mg/day	1	(0.6%)	1	(1.2%)	1	(0.9%)	0	(0%)
1 mg/day	27	(16.3%)	37	(44.6%)	47	(44.3%)	30	(40.5%)
None	138	(83.1%)	45	(54.2%)	58	(54.7%)	44	(59.5%)

Drug Use

Table 5 indicates drug use by gestational age. Prior to pregnancy there were numerous women using inhalant street drugs (19.9%), marijuana (16.9%), orally ingested street drugs (6.6%), and IV street drugs (4.2%). Street drug use was markedly reduced by the time of the 12-week prenatal visit, and by the time of the 38-week prenatal visit there was virtually no reported street drug use, with only one person of 74 reporting any street drug use.

Over-the-counter drug use also decreased markedly from baseline, from 62.7% to 41.0% at the time of the 12-week prenatal visit (p=.002). After the 12-week prenatal visit there was no significant change in over-the-counter drug use. Nor was there any significant trend in the use of decongestant or over-the-counter pain medication, after an initial significant drop from baseline to the 12 week prenatal visit.

To assess whether the computed reduction in drug use could have been due to the highest risk patients dropping out of the program, drug use was assessed by whether or not the patient was seen at the 12-week prenatal visit. In general, the patients with the greatest amount of drug use at baseline were most likely to be seen at the 12-week prenatal visit, and there were no drugs for which there was a negative association between baseline use and being seen at the 12-week prenatal visit.

Nutrition

Table 6 shows the amount of mean daily food consumption for 7 food groups at baseline, versus the last subsequent prenatal visit, for those patients who had values recorded at both baseline and at least 1 subsequent visit. For the 150 women for whom this information is available, milk, meat, fruit, vegetables, and bread demonstrated statistically significant increases from baseline. Fat and sugar demonstrated non-statistically significant decreases from baseline.

Supplemental Vitamins

Table 7 shows that by the 12-week prenatal visit, the percent of women using prenatal vitamins 100% of the time rose from 25.9% to 69.9% (p<.001), and the percent of women who didn't use prenatal vitamins at all decreased from 66.3% to 12.0% (p<.001). There was no significant change in prenatal vitamin use after the 12-week prenatal visit. A similar trend was shown for folic acid, for which daily use rose from 16.9% at baseline to 45.8% at the time of the 12-week prenatal visit (p<.001).

DISCUSSION

The main findings of this study were large and highly statistically significant improvements in several prenatal risk factors known to have large effects on pregnancy outcome, in a comparison of baseline (pre-pregnancy) values, versus values obtained on subsequent prenatal visits to the Waukesha County Health Department's PNCC Program.

This included large reductions in alcohol consumption, cigarette smoking, and street drug use, as well as increases in the consumption of prenatal vitamins and several important food groups.

A wealth of literature exists which demonstrates that the changes in risk factors demonstrated in this study are likely to result in improved pregnancy outcomes. Cigarette smoking during pregnancy has been shown to result in prenatal death, low birth weight, preterm delivery, miscarriage, and fetal growth retardation.[2,3] Pregnant women who stop smoking by the 30th week of gestation give birth to infants with higher birth weights than infants born to women who continue to smoke throughout pregnancy.[3] Excessive use of alcohol during pregnancy can result in the fetal alcohol syndrome,[4] whereas lesser amounts of alcohol consumption during pregnancy can result in growth retardation and neurologic problems.[5] The regular use of cocaine and opiates

by pregnant women has been associated with impaired fetal growth and premature birth.[6] Opiate use in the third trimester may lead to withdrawal symptoms in newborns,[7,8] and cocaine use may lead to tremors, hyperexcitability, and hypertonicity in newborns.[7] The need for adequate nutrition during pregnancy is the result of increased requirements for energy and nutrients such as protein, calcium and iron,[9,10] and perinatal programs which provide nutritional support during pregnancy have been shown to be associated with improved perinatal outcomes.[11]

Randomized trials have demonstrated a reduced risk of neural tube defects in the offspring of women who use folic acid supplements during pregnancy,[12,13] and case-control studies have shown a reduced risk of neural tube defects in women who take multi-vitamins prior to pregnancy and up to 3 months following conception.[14,15]

One problem with our findings is the incomplete data. Attendance at the various prenatal clinics/home visits ranged from 64% at the second prenatal visit to 45% at the third prenatal visit. However, the fact that there was no association between baseline risk factors and subsequent attendance at any of the prenatal visits suggests that this probably did not introduce bias into the study. In any event, the decreases in reported risk factors were so substantial that even if substantial bias did exist it would have been very unlikely to have affected the main conclusions.

Another potential problem is the accuracy of the risk factor data. Consideration must be given to the possibility that patients may have under-represented the magnitude of their risk factor behavior because they were embarrassed about admitting to it. However, the data was obtained in the same manner at baseline as it was for subsequent prenatal visits. Unless risk factors were more under-represented at follow-up than at baseline prenatal visits, this loss of accuracy would not have substantively altered the main conclusions of the study.

It is also important to note that nurses who participated in the program believe that patients were more likely to be honest about reporting of risk factors at subsequent visits than at baseline because of stronger relationships between the patients and the nurses.

Lastly, it is important to consider the possibility that some or many of the women seen in the PNCC Program may have exhibited improvement in risk factors even if not seen in this program. This could have been due to pre-existing knowledge of the need to change their behaviors during pregnancy. No doubt, this was at least partly a factor. In order to ascertain how much of a factor such pre-existing knowledge might have been in producing the vast reductions in risk factors seen in this study, it would be necessary to conduct a randomized controlled study, where the control group is not offered intervention, and yet they are seen periodically for the collection of information on risk factors. Because of the known effect of these risk factors on pregnancy outcome, it is questionable whether such a study would be ethical at this point.

In summary, this study shows the potential for departments of public health to undertake a program of pregnancy risk factor assessment and intervention, which successfully alters pregnancy risk factors, so as to substantially increase the likelihood of successful pregnancy outcomes.

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Racial Disparities in African American and White Infant Mortality United States and Wisconsin, 1980 to 1998

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ABSTRACT

Infant mortality is a powerful indicator for assessing the health of a population, and the extent to which society invests in its children. This paper examines infant mortality trends in the United States and Wisconsin among the African American and white populations from 1980 to 1998. Data from the National Center for Health Statistics and Wisconsin Birth and Infant Death Reports were used to examine overall infant mortality trends from 1980 to 1998 for African American and white infants. The overall infant mortality rate in Wisconsin decreased steadily from 10.3 infant deaths per 1000 live births in 1980 to 7.2 in 1998. White infant mortality followed this trend, declining from 9.6 in 1980 to 5.6 in 1998. African American infant mortality has remained about the same since 1980 at 18 infant deaths per 1000 live births, even though the overall percentage of African American live births in Wisconsin increased from 6% in 1980 to 10% in 1998. The ratio of African American to white infant mortality rates in Wisconsin increased from 2 to 1 in 1980 to 3.2 to 1 in 1998. While the Wisconsin African American infant mortality rate remained even since 1980, the US rate declined from 22.2 in 1980 to 14.1 in 1998. The Wisconsin African American rate in 1998, 17.9, surpassed the national rate. The use of 5-year running averages to smooth out year-to-year fluctuations showed statistically significant declines in Wisconsin white infant mortality rates and no change in Wisconsin African American infant mortality rates. These trends show the importance for Wisconsin to sustain its current efforts to reduce black infant mortality. At the same time, Wisconsin-based research efforts to determine strategies and factors that work should continue and influence the future design of systems, programs, and policies to eliminate the disparity.

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INTRODUCTION

Infant mortality is a powerful indicator for assessing the health of a population and the extent to which society invests in its children.[1] The Wisconsin public health plan, *Healthier People in Wisconsin: A Public Health Agenda for the Year 2000*, stated that "by 2000, the infant mortality rate will be reduced to no more than 9 infant deaths per 1000 live births, within any county, racial/ethnic, or age group."

In the United States and in Wisconsin, infant mortality has declined steadily since 1980. In Wisconsin in 1998, 488 infants died before age 1.[2] In the U.S, an estimated 28,486 infants died in 1998.[3] The 1998 overall Wisconsin infant mortality rate was 7.2 infant deaths per 1000 live births compared to 10.3 in 1980.[4] The 1998 overall rate for the U.S. was also 7.2, as compared to 12.6 in 1980.[5] For the year 1996, Wisconsin ranked 25th out of the 50 states for its infant mortality rate.

While both the United States and Wisconsin have shown steady declines in overall infant mortality rates since 1980, significant disparities between the African American and white populations have persisted. This gap is one reason that the United States continues to have one of the highest infant mortality rates among developed countries. The purpose of this paper is to compare infant mortality trends for the United States and Wisconsin among the African American and non-Hispanic white population from 1980 to 1998. A future article will discuss and analyze these data and their contributing factors such as birth weight, cause of death, and socioeconomic and cultural variables. A companion article in this issue of *WMJ* describes one of Wisconsin's current efforts to address the African American infant mortality disparity.

> Infant mortality refers to the death of a baby before its first birthday.
>
> The infant mortality rate is defined as the number of infant deaths per 1000 live births.

METHODS

Data on infant mortality for the United States (1980-1998) were obtained from the National Vital Statistics

Reports, National Center for Health Statistics, Centers for Disease Control and Prevention. Data on infant mortality for Wisconsin (1990 to 1998) were collected from the Wisconsin Department of Health and Family Services, Division of Health Care Financing, Bureau of Health Information, Wisconsin Births and Infant Death Annual Reports 1980 to 1998. We calculated the percent of African American births in Wisconsin by dividing the number of African American births by the total number of Wisconsin resident births for the years 1980 to 1998. All data for whites refer to the non-Hispanic white population. To compare the US African American and white infant mortality rates to Wisconsin's African American and white rates, we used year-to-year published data from 1980 to 1998. For Wisconsin African American and white infant mortality rates, we calculated 5-year running averages from the number of births and deaths per year to smooth yearly fluctuation and assess trends; 95% confidence intervals were calculated around the rates to check for significance. The number of births and deaths by race and year were not available for the United States since 1980, so we were unable to calculate 5-year running averages for comparison to the Wisconsin averages. African American to White infant mortality ratios were calculated by dividing the African American rate for a given year by the white rate for that same year.

RESULTS

Table 1 shows that the percentage of African American live births in Wisconsin increased steadily from about 6% of all births in 1980 to almost 10% of all births in 1998.

Table 2 shows that the overall rate of infant mortality in Wisconsin, apart from a few variations, decreased gradually from 10.3 infant deaths per 1000 live births in 1980 to 7.2 in 1998. However, the African American infant mortality rate remained about the same, with a few fluctuations (a high rate of 19.8 in 1984 and a low rate of 13.4 in 1997). The white rate decreased steadily, from 9.3 in 1980 to 5.6 in 1998.

Figure 1 compares the US African American and white infant mortality rates by year from 1980 to 1998 to the comparable rates for Wisconsin. While the Wisconsin African American rate remained essentially the same since 1980, the US black rate declined from 22.2 in 1980 to 14.1 in 1998. In 1998, the US black rate was less than the Wisconsin black rate of 17.9. Although Wisconsin white infant mortality fluctuated a few times during the 1980 through 1998 period, it showed a steady decline from 9.6 in 1980 to 5.6 in 1998, and followed the same linear trend as the US white infant mortality rate. The ratio of the African American to the white rate in Wisconsin increased from 2.0 to 1 in 1980 to 3.2 to 1 in 1998. The comparable ratio for the United States as a whole rose from 2.0 to 1 in 1980 to 2.4 to 1 in 1998.

Table 1. Percent of African American Births Compared to Total Wisconsin Births, 1980 to 1998

Year	% of African American Births to Total Births	Year	% of African American Births to Total Births
1980	6.0	1990	9.8
1981	6.0	1991	9.9
1982	6.1	1992	10.3
1983	6.5	1993	10.2
1984	6.8	1994	10.0
1985	7.3	1995	9.6
1986	7.9	1996	9.5
1987	8.5	1997	9.6
1988	9.0	1998	9.6
1989	9.6		

Table 2. Infant Mortality Rates, Total, White, and African American, Wisconsin, 1980 to 1998

Year	Total*	African American	White
1980	10.3	18.2	9.3
1981	10.3	16.9	9.7
1982	9.4	**19.8**	**8.7**
1983	9.6	**17.0**	8.7
1984	9.9	19.8	9.0
1985	9.2	17.5	8.4
1986	9.3	18.0	8.4
1987	8.6	17.3	7.7
1988	8.5	17.2	7.2
1989	9.2	18.9	7.9
1990	8.4	19.7	7.2
1991	8.4	14.0	7.7
1992	7.3	14.0	6.3
1993	7.9	14.9	7.0
1994	7.9	18.6	6.5
1995	7.3	17.9	6.2
1996	7.3	18.3	5.9
1997	6.5	13.4	5.5
1998	7.2	17.9	5.6

*Includes all races

The number of African American infant deaths in Wisconsin is relatively small compared to the number of white deaths. Therefore, we also used 5-year running averages to smooth out possibly random year-to-year fluctuations and to better understand the trends for the African American and white infant mortality rates in Wisconsin. Figure 2 confirms a significant ($P < .05$) decline in the white infant mortality rate in Wisconsin (from 9.1 for the period from 1980 through 1984 to 5.9 for 1994 through 1998) and a stable African American rate (18.7 in 1980 through 1984 to 17.2 for 1994 through 1998). We were unable to calculate a black to

Figure 1. U.S. African American and White Infant Mortality Rates Compared to Wisconsin, 1980 to 1998.

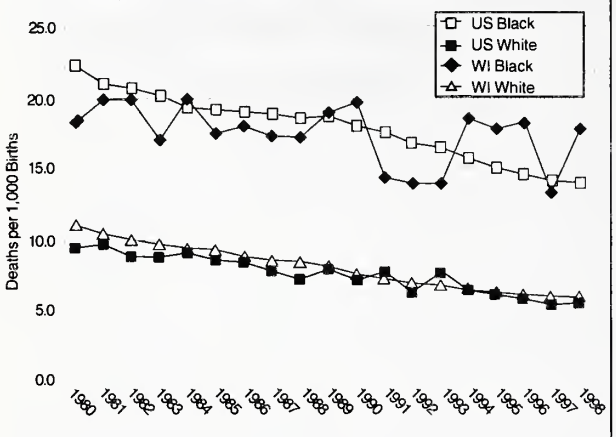
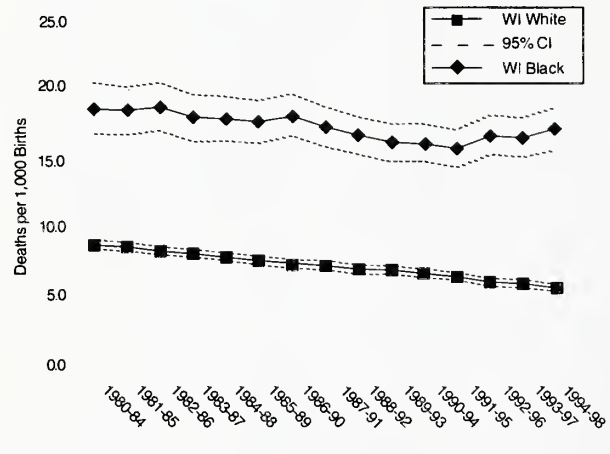


Figure 1. U.S. African American and White Infant Mortality Rates Compared to Wisconsin, 1980 to 1998.



white infant mortality ratio because of the unavailability of 5-year running averages for the US population.

DISCUSSION

The white infant mortality rate in Wisconsin has declined steadily since 1980. During the same period, the African American rate has essentially remained the same. In contrast, the African American infant mortality rate for the United States as a whole declined from 22.2 in 1980 to 14.1 in 1998. Thus, the African American to white disparity in Wisconsin significantly increased from 1980 to 1998, and the gap between these 2 groups in Wisconsin in 1998 exceeded the national gap. Furthermore, the Wisconsin African American rate itself exceeded the black rate for the nation as a whole in 1998.

Wisconsin data also show disparities in infant mortality for Native American and Hispanic non-white babies compared to the white population, although not as marked. A future article will describe the data and trends for these groups.

During the past decade, Wisconsin has implemented several major efforts to reduce infant mortality as a whole as well as the disparities for African Americans and other groups, including Native American and Hispanic non-whites. A recent article in the *Wisconsin Medical Journal* reported a decline in the Native American infant mortality rate for Wisconsin from 20.2 during the period of 1983 to 1987 to 10.8 during 1993 to 1997.[6]

The Wisconsin Department of Health and Family Services convened a Work Group in 1995 to examine the reasons for high infant mortality among blacks. This Work Group developed a community-based and resiliency-focused research project that is currently in process. The trends described in this paper demonstrate the importance for Wisconsin to continue to carefully examine its current efforts to reduce black infant mortality in order to achieve the *Healthy People 2010* objective of 100% access and 0% disparities for infant mortality and other conditions.

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Benefits of Breastfeeding: A Review for Physicians

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Breast milk is the recommended form of infant nutrition for at least the first year of life by the American Academy of Pediatrics[1] and the World Health Organization[2] due to the health benefits it provides children and mothers. The American College of Obstetrics and Gynecology[3] and American Academy of Family Physicians[62] also recommend breast milk as the ideal form of infant nutrition. This article reviews the benefits of breastfeeding with recent studies applicable to populations such as those in Wisconsin (i.e., developed countries controlled for socioeconomic status, smoking, day care, maternal education, etc.). Despite knowing the benefits of breastfeeding for mother and baby, mothers may choose not to breastfeed. It is helpful for physicians to be aware of the influences on a mother's decision to breastfeed to identify potential areas for education and support.

ADVANTAGES OF BREASTFEEDING FOR THE INFANT

Recent research in the United States and other developed countries among predominantly middle class populations has shown nutritional, immunological and developmental benefits of breast milk for the child.[1,4,9-35] Human milk is unique and species-specific.[6,8] Antibodies found in the mother's milk are specific to her environment, therefore providing the ideal protection for her infant.[7] Breast milk changes composition during individual feedings and over time to provide optimal nutritional and immunological benefits to the baby.[6,8] Breast milk contains antimicrobial, anti-inflammatory and immunomodulating components that act together to decrease infections and increase both short-term and long-term immunity for the baby.[5-7] These special properties are in contrast to formula, which is homogeneous during feeds and over time and does not contain protective factors.

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Direct acting antimicrobial factors protect the infant by inhibiting bacterial pathogens.[5] Factors such as lactoferrin, lysozyme and secretory IgA act as defense agents.[5-7] Secretory IgA protects the infant from infection by binding to microbes in the digestive tract and preventing them from passing through the walls of the gut.[5,6] Human milk secretory IgA antibodies against common pathogens include those to E. coli, Salmonella, Shigella, H. influenzae, S. pneumoniae, rotavirus and respiratory syncytial virus.[5,8] Lactoferrin helps to decrease pathogenic bacteria by binding to iron thereby reducing the availability of iron for E. coli and other bacteria that thrive on iron.[7,8] Lysozyme provides bactericidal and anti-inflammatory protection by acting with other factors to destroy bacteria such as E. coli and some Salmonella strains.[6,7] Cellular components of human milk include neutrophils, macrophages, B and T lymphocytes, which act directly as phagocytes in the gut or work to mobilize other components of the immune system.[5,6,7]

Anti-inflammatory agents in human milk include enzymes that degrade mediators of inflammation, growth factors and cytoprotective agents.[5] Enzymes in human milk that degrade inflammatory mediators may aid in disrupting the pathogenesis of necrotizing enterocolitis.[5] Growth factors, such as epidermal growth factor, appear to enhance gut maturation, limit penetration of pathogenic microorganisms and foreign antigens, and may increase the development of the neonate's own intestinal host defenses.[5,6]

Human milk has immunomodulating factors such as tumor necrosis factor alpha and other cytokines.[5] While their interactions are complex, it is believed that they play a role in the decrease of incidence and severity of chronic diseases seen in children who were breastfed as infants.[5] Human milk also contains long chain polyunsaturated fatty acids (18-22 carbon length), such as arachidonic acid (AA) and docosahexaenoic acid (DHA), which are important for brain and retinal development.[6,8]

Multiple studies reveal that breastfed infants have reduced incidence and/or severity of bacterial and viral infections even after controlling for such factors as socioeconomic status, smoking, day care and educational background.[9-20] Breastfeeding appears to provide

dose-related protection, with protection increasing the longer the infant receives breast milk. For example, exclusive breastfeeding for longer than 1 month decreased food allergy at 3 years of age and respiratory allergy at 17 years of age, while breastfeeding for at least 6 months also decreased eczema at 3 years of age and atopy at 17 years of age.[21] Several studies have also shown clear decreases for breastfed babies for otitis media,[9-11] meningitis,[9,12,13] lower respiratory infection,[14-16] bacteremia,[12,17] diarrhea,[9,14,18] and necrotizing enterocolitis.[19,20]

Chronic diseases are less frequent and less severe in infants who have received breast milk.[16,21-25] Children who were breastfed as infants have significantly fewer symptoms of asthma, eczema and allergic diseases.[16,21,22] There is also a possible protective effect of breast milk on type-1 diabetes mellitus,[23,24] Crohn's disease,[25] and lymphoma.[26,27]

Breast milk appears to enhance cognitive development.[28-30] Premature infants who received tube feedings of breast milk versus formula were more advanced developmentally at 18 months and at 7 and 8 years of age than matched controls that had received formula, after controlling for social and educational differences.[28] The IQ score of children with phenylketonuria was 12.9 points higher in those whose mothers had breastfed rather than formula fed prior to dietary intervention, after controlling for social and maternal educational status.[30] Visual acuity was found to be significantly higher in premature infants[31] and term infants[32] fed breast milk versus formula, even when DHA was added to formula.[4]

Breastfeeding as a process also appears to provide significant advantages over bottle feeding.[33-35] The process of suckling at the breast protects the middle ear relative to bottle feeding and may be a factor in the reduced incidence of otitis media in breastfed infants.[33] Premature babies were found to have higher oxygen saturations and more integrated breathing and sucking patterns while breastfeeding in comparison to bottle feeding.[34] In a study of infants with congenital heart disease, oxygen saturation was significantly higher and less variable when breastfeeding versus bottle feeding.[35] Overall, the unique composition of breast milk provides infants with significant short- and long-term immunological and developmental benefits.

ADVANTAGES OF BREASTFEEDING FOR THE MOTHER

Breastfeeding also endows the mother with several health benefits. A breastfeeding woman is unlikely to ovulate while the baby is solely breastfeeding without supplementation. The Lactation Amenorrhea Method (LAM) of contraception has been well documented as an effective means of contraception. If a woman is fully breastfeeding her baby during the first 6 months postpartum with minimal supplementation, and if she is amenorrheic, she will have less than a 2% risk of becoming pregnant during that first 6 months.[36]

When a woman breastfeeds, an oxytocin surge occurs. The uterus responds to the oxytocin by clamping down, thereby helping to bring the uterus back to its prepregnancy state. Therefore, having the baby nurse within the first hour after birth makes sense evolutionarily, as the oxytocin released from breastfeeding will help with expulsion of the placenta and reduce the risk of excessive postpartum bleeding.

Women who are type-1 diabetics find that they markedly reduce their insulin needs while nursing despite an increase in carbohydrate intake.[37] This certainly may be empowering for a diabetic woman, as she recognizes her ability to have better diabetic control through behavioral means. Diabetic women who do not breastfeed postpartum, however, resume their prepregnancy insulin doses.

Women who have chronic physical disabilities may find breastfeeding advantageous.[63] A physically challenged mother may gain a heightened self-esteem by her proven ability to nourish her child on her own. Breastfeeding can be easier for a mom with physical limitations, as she can nurse lying down, and also rest while the baby nurses. Further, she does not need to prepare bottles. Because babies who breastfeed are often healthier, fewer trips to the doctor's office may be needed, because of fewer and less severe infections. Breastfeeding will also enhance the bonding between the mother and the baby, especially if the mother relies on household help to assist in care for the baby.

The duration of breastfeeding by a woman reduces her risk of endometrial, ovarian and breast cancers. Women who breastfeed for at least 72 months total have the greatest protective effect from endometrial cancer, although this effect is not present over the age of 55. Breastfeeding less than 12 months does not provide a persistent protective effect from endometrial cancer, however, breastfeeding for 13-72 months provides a possible protective effect from endometrial cancer for up to 21 years.[38] Epidemiologic studies of epithelial ovarian cancer have shown that a woman's risk of epithelial ovarian cancer is decreased if she has ever breastfed.[39] The duration of breastfeeding thus far has not been shown to be as protective as whether or not breastfeeding has occurred. The studies done on breastfeeding and the risk of breast cancer have been conflicting. Several studies have shown a lack of association between incidence and/or duration of breastfeeding and risk of breast cancer.[40] However, some studies certainly have shown a reduced risk of premenopausal breast cancer with prolonged breastfeeding.[41] The differences in these studies may well have to do with the variation

Table. Immune Benefits of Breast Milk

Factor	Action
Direct Acting Anti-microbial Factors: Antibodies – Secretory IgA	Protects against many bacteria, viruses, parasites e.g. E. Coli, Salmonella, Shigella, H. Influenzae, S. Pneumoniae, rotavirus, respiratory syncytial virus
Lactoferrin	Inhibits complement, binds to iron - decreases availability of iron for E. Coli and other pathogenic bacteria
Lysozyme	Inhibits neutrophil function, disrupts bacterial cell walls
Cellular components: neutrophils, macrophages, B and T lymphyocytes	Act directly as phagocytes or work to mobilize immune system
Anti-inflammatory Agents: Antioxidents: ascorbic acid, cysteine	Interferes with PMN leukocyte oxygen, metabolic and enzymatic activities
Enzymes: e.g. catalase, histaminase	Degrade inflammatory mediators e.g. hydrogen peroxide, histamine
Epidermal Growth Factor	Enhances gut maturation, limits gut penetration
Immunomodulating Factors: Interleukin-10	Suppresses pro-inflammatory cytokine production
Antioxidants: e.g. ascorbic acid,cysteine	Interferes with PMN activities
Arachadonic acid, Docosahexaenoic acid	Brain, retinal development

of the female population studied. The studies that investigate a large number of premenopausal breast cancers, and not mainly postmenopausal breast cancers, may uncover more of an effect from breastfeeding. Populations where breastfeeding takes place for a long period of time, greater than 2 years, may be more likely to show an effect of breastfeeding duration on breast cancer risks than those populations where breastfeeding takes place for a much shorter period of time, and perhaps is more heavily supplemented. It appears that more studies are needed, with the involvement of young women who nurse for long periods.

Breastfeeding certainly provides the mother with frequent, prolonged opportunities to hold her baby. Increased physical contact is associated with a more secure emotional attachment between mother and baby whereas less physical contact between mother and baby has been associated with avoidant attachment and neglectful care.[42] Certainly extra efforts to encourage "at risk" moms to breastfeed may lead to a healthier mother-baby relationship through increased physical contact.

FEW CONTRAINDICATIONS TO BREASTFEEDING

There are few real contraindications to breastfeeding in the United States. Infants with special dietary needs may be unable to breastfeed, primarily those with a lactase deficiency or galactosemia.[4] Infants with phenylketonuria can breastfeed, though they may need supplementation with a phenylalanine-free formula.[4] Women who are HIV positive are advised to not breastfeed, due to the risk of transmission of HIV through breast milk. This advice is not the same for women in certain developing countries, where the risk of death from artificial feeding and subsequent infection is much higher.[4] These same guidelines are also recommended for the mother with HTLV-1.[4]

Women with herpes simplex lesions of the breast should refrain from breastfeeding, especially in the first few months of life when HSV illnesses can be life threatening.[4]

Certain maternal medications are contraindicated in a breastfeeding mother. In cases where the maternal medication cannot be changed, breastfeeding should be interrupted. These medications are primarily antimetabolites, drugs of abuse, and drugs that suppress lactation. Many excellent sources of information regarding drugs in breastfeeding are available.[4,57]

THE DECISION TO BREASTFEED

Women who initiate breastfeeding have usually made the decision either preconceptionally or early in their pregnancy,[43] have mothers who breastfed,[44,46] and have received male endorsement of their choice to breastfeed.[44] A recent study indicates that positive attitudes are important predictors of initiation of breastfeeding.[45] In addition, a mother's confidence in her ability to breastfeed[47] and a strong family support system have been linked to longer duration of breastfeeding.[46,48] Physicians who provide care to prenatal families have the opportunity to present parents with accurate information to ensure an informed infant feeding decision. Mothers who are given positive advice about breast-

feeding from a physician are much more likely to initiate breastfeeding regardless of ethnic or economic diversity.[49,50,52] Individual prenatal breastfeeding counseling and support have demonstrated a significantly higher percentage of women changing from prenatal bottle-feeding plans to actually breastfeeding postpartum.[51]

Breastfeeding education strategies that can be incorporated into prenatal visits include dispelling common myths, focusing on issues that are identified as significant barriers to breastfeeding, discussing the positive aspects of breastfeeding and assessing a woman's support system prenatally and again postpartum. Women who plan to return to work or school can be educated about methods to facilitate continued breastfeeding by expressing breast milk and can benefit from peer support provided by other employed breastfeeding mothers in the physician's practice. Additionally, members of a woman's social network including the baby's father and the maternal grandmother can be targeted to receive breastfeeding education during prenatal visits. Surveys of various cultural populations have shown that the majority of women are aware that "breastfeeding is healthier" but this knowledge alone may not outweigh perceived social norms or the influence of family and peers.[48,52]

Since educational literature is a primary source of breastfeeding information for pregnant and breastfeeding women,[43] patient pamphlets and office magazines can be assessed for incorrect or subtle messages that depict a negative connotation about breastfeeding. The office environment provides the opportunity to reflect the physician's support for breastfeeding: pictures of breastfeeding women, an area for nursing mothers, and the absence of overt formula promotional items for patient or professional use.

Antepartum distribution of formula coupons or samples through the physician's office often sends ambiguous messages to prenatal families of the physician's true intentions to promote breastfeeding.[53] Physicians can also have a significant impact on the breastfeeding practices that become the standards of care in their communities. Hospitals that have policies which facilitate early initiation of breastfeeding,[54] encourage exclusive breastfeeding[55] and eliminate distribution of formula company discharge packs[56] have demonstrated increased breastfeeding rates.[61]

Successful breastfeeding initiation depends not only on hospital experiences but also the opportunity for new mothers to access breastfeeding expertise, particularly in the early postpartum period.[46,48,52] Most breastfeeding problems, if identified and treated early on, need not pose a threat to the continuation of successful breastfeeding.[61] There are a growing number of breastfeeding articles, books and courses available for physicians.[8,58-60] In addition, there are usually breastfeeding support resources in one's community. These may include private lactation consultants, hospital-based lactation consultants, local health department maternal child health nurses, WIC Program breastfeeding specialists, and La Leche League. A physician, after assessing his or her own needs for professional lactation information, can team up with those who provide lactation services in the community. Such cooperation can greatly facilitate the appropriate diagnosis and treatment for a lactating woman with problems.

SUMMARY

Physicians can support breastfeeding for their patients by providing prenatal families with accurate and current information on the benefits of breastfeeding, eliminating barriers to breastfeeding in both their office and hospital environments, and recognizing the significant impact the physician may have on the breastfeeding practices of their patients and the support for breastfeeding in their communities.

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EDITOR'S NOTE

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The Need for a Second Dose of Ceftriaxone in Febrile Infants Age 4-8 Weeks

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ABSTRACT

Objective: To determine if a second intramuscular injection of ceftriaxone was necessary in febrile infants who meet low-risk criteria for outpatient therapy.

Setting: Children's Hospital Emergency Department.

Patients: Febrile infants 4-8 weeks of age.

Methods: Outpatient treatment criteria included non-toxic appearance, no identifiable source for infection on physical examination, CSF WBC $\geq$ 10/mm^3, peripheral WBC $\leq$ 15,000/mm^3, normal UA, and normal chest radiograph study, if obtained. Additional requirements included a reliable caretaker and re-evaluation in 24 hours. Infants who met these criteria received intramuscular ceftriaxone 50 mg/kg with instructions to follow-up in 24 hours. At the follow-up visit, infants with no identifiable source for infection and negative cultures received a second dose of intramuscular ceftriaxone and were discharged. Cultures were read at 48 hours and at the conclusion of the study. Medical records were reviewed to identify delayed complications.

Results: 172 infants were enrolled. The mean age was 45 days. All CBC, UA, CSF analyses were normal. Chest radiographs were obtained in 56 (30%) infants; all were normal. One (.05%) patient was admitted at the follow-up visit. The mean time to follow-up was 25 hours. Two positive cultures were identified at the re-evaluation visit; one blood culture grew *Salmonella* and a urine culture grew *E. coli.* The CSF cultures were all negative at follow-up and remained negative.

Conclusion: Febrile infants 4-8 weeks of age who meet outpatient therapy criteria and have negative cultures and no identifiable source for infection at 24 hours may not require the second dose of intramuscular ceftriaxone.

INTRODUCTION

The management in infants 4-8 weeks of age with a fever without an apparent source on history or physical examination presents a challenge to physicians.[1-6] Although the current recommendations for diagnostic studies of these infants are generally accepted, disposition and management remain controversial.[2]

Two schools of thought exist regarding the appropriate management of well-appearing febrile infants. One group states that selected febrile infants who meet low risk criteria for serious bacterial infection can be effectively managed as outpatients with the administration of an initial intramuscular dose of ceftriaxone and clinical re-evaluation and a second injection of intramuscular ceftriaxone within 24 to 48 hours.[1,2] Baker et al[3] state that a substantial number of febrile 4-8 week old infants who meet the low risk criteria can be safely observed as outpatients without antibiotics.

The purpose of this study was to determine the need for a second dose of intramuscular ceftriaxone in febrile infants 4-8 weeks of age who meet the criteria for outpatient management and have negative cerebrospinal fluid (CSF), blood and urine cultures and no focus for infection at the follow-up visit.

METHODS

We conducted a prospective, descriptive study of all infants 4-8 weeks of age with documented rectal temperature $\geq$ 38.0° C by history or by direct measurement in the emergency department (ED) of a tertiary care children's hospital. Infants who met low risk criteria for outpatient therapy were eligible for enrollment (Appendix 1). Additional requirements for outpatient management included a reliable caretaker and re-evaluation within 24 hours of the initial assessment.

Infants with an identifiable source for infection, infants needing hospitalization and those suspected of having a serious bacterial infection were excluded. Serious bacterial infection (SBI) included clinical or laboratory evidence suggestive of bacteremia, meningitis, urinary tract infection, pneumonia, infectious enteritis, and bone or joint infection. To ensure enrollment of all eligible infants, one investigator (SEA) reviewed the ED log daily. Enrolled infants underwent a complete physical examination (PE), CSF analysis and culture, complete blood count (CBC), blood culture (BC), and UA by catheterization and urine culture. A chest radiograph and stool culture were obtained at the discretion of the ED attending physician.

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Infants meeting the low risk criteria and the additional requirements for outpatient therapy received the first dose of intramuscular ceftriaxone (50 mg/kg). The private physician was contacted prior to discharge from the ED to designate the site for follow-up visit at the physician's office or the ED. At the follow-up visit, infants who appeared well, had no identifiable source of infection on PE and negative blood, urine, and CSF cultures received a second dose of intramuscular ceftriaxone and were discharged. Cultures were considered positive if growth of pathogenic organisms was noted within 48 hours. At the conclusion of the study the medical records of all enrolled infants were reviewed to identify infants who had positive cultures after 48 hours of incubation and for the development of any delayed complications. The study protocol was approved by our institution's Research and Publication Committee and the Human Rights Review Board.

RESULTS

Between October 1996 and September 1997, 177 infants met the inclusion criteria and 5 were excluded, as their medical records were unobtainable for review. Of the 172 infants enrolled, 89 infants (52%) were male and 83 (48%) were female. Seventy-seven (45%) infants were Caucasian, 65 (38%) African-American, and 26 (15%) Hispanic. The mean age of all infants was 45 days (range: 28-61), and the mean temperature was 38.5°C (range:38.0°C - 40.5°C). All CBC, UA, and CSF analyses were normal. Chest radiographs had been obtained in 56 infants (30%); all were reported as normal. One hundred five (62%) infants were re-evaluated at the private medical doctor's office and 67 (38%) in the ED. The average time to follow-up in the ED was 25 hours (range: 13-32). Two infants were followed-up at 48 hours. The BC of one yielded a positive growth of *Salmonella* within 24 hours, but on the re-evaluation visit, the infant appeared non-toxic and had no other identifiable source for the fever. The infant was admitted and a repeat BC obtained prior to treatment with intravenous antibiotics was negative. The urine culture in a second infant, whose UA was normal, yielded a growth of *E. coli* within 24 hours. The private medical doctor elected to treat this infant as an outpatient.

There were no delayed complications requiring return to the ED or admissions to the hospital in any of our study infants. All cultures that were reported negative at 24 hours remained negative.

DISCUSSION

The management of febrile infants 4-8 weeks of age continues to pose a dilemma for physicians.[2] In 1984, febrile infants under 8 weeks were routinely managed by hospitalization.[4] This approach was recommended based on the prevalent opinion that clinical assessment and laboratory values could not identify infants at risk for serious bacterial infection (SBI).[4,5,6] DeAngelis et al[7] evaluated the iatrogenic and financial costs of hospitalized febrile infants. The authors observed 48 complications in 19.5% of all admissions. Six of these complications were noted in infants who may not have required admission for treatment. Furthermore, they stated that 60.4% of these complications were preventable. This observation began to raise the question of outpatient management as a viable alternative. In 1985, Dagen et al[8] published the Rochester criteria, a low risk criteria developed to identify infants unlikely to have SBI. The authors concluded that infants younger than 3 months who have normal PE, normal white blood cell and band counts, and normal urine findings are unlikely to have serious bacterial infections. McCarthy et al[1], in 1990, supported the continued use of these low risk criteria and recommended that a select group of infants could be treated on an outpatient basis with intramuscular ceftriaxone.[1] In addition to the infants meeting low risk criteria, their caretakers had to be judged as reliable, have telephone access, and vehicle for transportation.[1] Intramuscular ceftriaxone was chosen because the extended serum half-life and high serum concentrations achieved after intramuscular administration provided a minimum of 24 hours of antibiotic coverage for these infants.[1,9] Additional studies supported the routine use of ceftriaxone for the treatment of the febrile infant at low risk for serious bacterial infection.[2]

Baraff et al[10], in 1993, published practice guidelines for febrile infants which endorsed the use of intramuscular ceftriaxone for the treatment of febrile infants. In another study, Baker et al[3], developed screening criteria and applied them to febrile infants 29-59 days old without identifiable sources of infection on PE and normal laboratory results. They concluded that infants who met their screening criteria might be considered for outpatient management without antibiotics.[3]

Universal acceptance of Baker's et al[3] strategy has not been achieved. Our study was undertaken to determine if a negative culture at 24 hours would remain negative at 48 hours. If correct, infants without an identifiable source for fever on PE and negative cultures at 24 hours would not be at risk for having serious bacterial infection, thus eliminating the need for a second dose of intramuscular ceftriaxone. In our study, the incidence of serious bacterial illness was 1.1% which is comparable to published incidence rates which range from 0.4% in Baker's[3] study to 1.4% in Baraff's study.[10] The cultures were reported positive within 24 hours by the microbiology laboratory in our 2 patients. Neither infant appeared ill at the initial evaluation nor the follow-up visit. A repeat BC was obtained prior to admission for parental antibiotics in the infant with

Salmonella and was negative. This infant recovered uneventfully and no complications were noted. The private physicians elected to treat the infant with *E. coli* urinary tract infection as an outpatient. No further cultures were obtained. Chart follow-up did not identify complications in this infant.

Our study has several limitations. The study focused only on low risk infants; no data was collected on non-low-risk infants and their rate of SBI. Compliance with follow-up for infants returning to their private physician's office was not evaluated. Determination of complications and progression of illness was limited to chart review and, therefore, the incidence of either could potentially be underestimated. However, in our community, this is highly unlikely as all infants requiring hospitalization are admitted solely to our facility.

We conclude that febrile infants 4-8 weeks of age who meet low-risk criteria and the additional requirements for outpatient therapy and who have negative cultures and no identifiable source of infection at the follow-up visit may not require a second intramuscular dose of ceftriaxone. A large, prospective, controlled study of one-dose versus two-dose regimes would be needed to further validate our results.

Appendix 1. Low risk criteria for outpatient management of febrile infants 4-8 weeks of age

Full term infant

Previously healthy

Well appearing

No identifiable focus of infection on physical examination

Normal laboratory tests:

- Total white blood count >5000 and ≤ 15,000
- Urinalysis ≤ 10 white blood cells per high power field
- Cerebrospinal fluid white blood cell count ≤ 10/mm^3

When indicated clinically:

- Normal chest radiograph
- Stool white blood cell count ≤ 5 per high power field

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Trends in Smoking During Pregnancy, Wisconsin 1990 to 1996

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ABSTRACT

Purpose: Smoking during pregnancy can be harmful to the fetus. This paper examines trends in smoking during pregnancy in the United States and Wisconsin from 1990-1996. In addition, percentage change in smoking prevalence during pregnancy by selected maternal characteristics and in all Wisconsin counties is compared for the periods 1990-1992 and 1994-1996.

Methods: Data from the National Center for Health Statistics and Wisconsin resident birth certificates were compared to examine overall smoking trends for pregnant women from 1990-1996. For Wisconsin, 3-year averages (1990-1992 and 1994-1996) were calculated to provide more stable estimates. The percentage change in smoking prevalence was examined by selected maternal characteristics, such as age, marital status, race, prenatal care and education, and by county of residence.

Results: Smoking rates for pregnant women in the United States have gradually decreased, from 18.4% in 1990 to 13.6% in 1996. From 1990 to 1996, maternal smoking in Wisconsin declined from 22.9% to 18.2% (significant at $P < .001$). In Wisconsin, smoking rates during pregnancy were higher in both 1990-1992 and 1994-1996 among women who were younger, unmarried, American Indian, or African American; received late or no prenatal care and did not graduate from high school. Out of 72 Wisconsin counties, 63 showed a decrease in smoking rates for pregnant women.

Conclusions: Smoking prevalence during pregnancy in Wisconsin is above the *Healthy People 2000* and Wisconsin Public Health Agenda for the Year 2000 goals of less than 10% of women smoking during pregnancy. Public health must continue its initiative to encourage healthy life styles for pregnant women.

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INTRODUCTION

It is well documented that smoking during pregnancy is harmful to the fetus. Smoking causes pregnancy complications, including miscarriage, stillbirth, impaired placental function, intrauterine growth retardation and preterm delivery.[1] One of the most common consequences of smoking during pregnancy is low birth weight (LBW) and the consequent need for neonatal intensive care.[2] Maternal smoking causes from 14,000 to 26,000 admissions to the neonatal intensive care unit (NICU) in the United States each year.[3,4] Sudden infant death syndrome (SIDS) is 2 to 4 times more common in babies whose mothers smoked during pregnancy than in other babies.[1] During the past decade, it has become increasingly clear that maternal cigarette smoking during pregnancy poses a risk for neurodevelopmental impairment in children.[5]

In this article, we compare overall smoking trends for pregnant women in the United States to those in Wisconsin. For Wisconsin women, we examine trends in smoking by selected characteristics of women, such as age, marital status, race, prenatal care and education. We also update data previously published in this journal[7] by analyzing data from Wisconsin resident birth certificates by county of residence for the years 1990-1992 and 1994-1996.[8]

We use these data to identify smoking trends across the state by showing counties with increases and decreases in smoking during pregnancy.

METHODS

Data Sources

Data on smoking in pregnancy are collected at the time of birth and recorded on the birth certificate. For this study, we obtained data for the United States from the National Vital Statistics Reports, National Center for Health Statistics, Centers for Disease Control and Prevention. Data for Wisconsin were from Wisconsin resident birth certificates collected and maintained by the Wisconsin Vital Records Section, Wisconsin Bureau of Health Information.

Table 1. Number and percentage of births in which the mother smoked during pregnancy, by maternal characteristics in Wisconsin, 1990-1992 compared with 1994-96.

	1990-1992		1994-1996		
Characteristic	Number of births	Percent smokers	Number of births	Percent smokers	Percent change
Age					
<20	22033	30	21253	27	10***
20-24	51482	30	44550	27	10***
25-29	71832	20	61643	16	20***
30-34	50855	17	52358	14	18***
35+	19122	15	23089	14	7
Marital Status					
Married	161049	16	147422	13	19***
Unmarried	54286	40	55473	35	12***
Race/Ethnicity					
White	180306	22	166771	19	14***
African American	21506	29	19673	24	17***
American Indian	2501	48	2397	44	8
Hispanic	5934	16	8392	11	31**
Lao/Hmong	3670	<1	3616	1	t
Other	1390	6	2005	4	t
Prenatal Care					
15t Trimester	175784	20	169205	17	15***
2nd Trimester	31220	31	26432	26	16***
3rd Trimester	6371	34	5258	29	15**
None	1679	43	1654	40	7
Unknown	284	16	361	21	t
Education					
Less than High School	36557	41	33164	35	15***
High School Graduate	87245	27	70097	25	7***
Some College	48925	16	50160	14	12**
College Graduate	42400	4	49242	3	25
Unknown	211	16	247	15	t
Total Smokers	48102	22.3	38302	18.8	15***
Total Births	215338	NA	202910	NA	NA

t The percentage change was not calculated for this group because there were fewer than 100 births to mothers who smoked
NA = Not applicable
** Significant at P<.05
*** Significant at P<.001

Data Analysis

We first compared the smoking rate of pregnant women nationally to Wisconsin's rate to see whether the smoking rate among pregnant women in Wisconsin was lower or higher than the national rate.

Next, for Wisconsin, we compared the percentage change in smoking during pregnancy by various maternal demographic characteristics (such as age, race, marital status, prenatal care, and education). We compared data from infants' birth certificates from the years 1990-1992 and 1994-1996. To improve the precision of our estimates, we used three-year averages for 1990-1992 and 1994-1996; we used these periods because the most recent data available at the time of writing was 1996. The percentage of women who reported smoking during pregnancy was calculated for each characteristic for 1990-1992 (T1) and 1994-1996 (T2). Then, the percentage change for each characteristic between the two periods was calculated using this formula: [(T2-T1)/T1] x 100 = percentage change. If there were fewer than 100 cases for a characteristic, the percentage change was not calculated, therefore, the total number of smokers for a characteristic may not equal the total number of smokers for that time period.

We then used this formula to calculate the percentage change for each county between the two periods; the percentage of women who reported smoking during pregnancy was calculated for each county for 1990-1992 (T1) and 1994-1996 (T2). Counties were then ranked by percentage change, with the largest positive change indicating the greatest percentage decrease in smoking by pregnant women. A negative percentage change indicates an increase in smoking between the two periods. The average change in smoking prevalence between 1990-1992 and 1994-1996 for all counties in the state was calculated. Ninety-five percent confidence intervals were determined.

Table 2. Number and percentage of births in which the mother smoked during pregnancy by county, Wisconsin, 1990-1992 compared with 1994-96.

	1990-1992		1994-1996					1990-1992		1994-1996			
County	No. of births	Percent smokers	No. of births	Percent smokers	Percent change	Rank	County	No. of births	Percent smokers	No. of births	Percent smokers	Percent change	Rank
Adams	526	36	513	37	-3	68	Marquette	423	29	415	27	7	48
Ashland	606	33	672	30	9	42	Menominee	371	45	259	47	-4	71
Barron	1688	25	1570	22	12	34	Milwaukee	50246	25	45398	20	20	16
Bayfield	488	32	425	26	19	23	Monroe	1724	28	1600	21	25	5
Brown	9257	22	9064	17	23	8	Oconto	1172	27	1122	21	22	9
Buffalo	514	17	467	15	12	36	Oneida	1113	26	1060	27	-4	70
Burnett	446	34	353	32	6	54	Outagamie	6758	15	6323	14	7	50
Calumet	1493	17	1449	16	6	53	Ozaukee	2859	13	2824	12	8	46
Chippewa	2092	25	1866	21	16	27	Pepin	273	21	234	18	14	30
Clark	1298	20	1367	16	20	20	Pierce	1298	19	1211	16	16	28
Columbia	1799	24	1833	23	4	60	Polk	1443	28	1342	26	7	47
Crawford	639	23	595	22	4	59	Portage	2568	18	2399	15	17	25
Dane	15739	16	14848	14	13	33	Price	569	25	495	20	20	15
Dodge	2918	22	2859	21	5	58	Racine	8085	26	7665	21	19	21
Door	945	20	784	18	10	39	Richland	633	20	591	19	5	56
Douglas	1671	29	1552	26	10	38	Rock	6442	29	5953	23	21	12
Dunn	1267	20	1317	16	20	19	Rusk	600	25	548	24	4	62
Eau Claire	3530	21	3330	19	10	41	Sauk	1938	25	2008	24	4	61
Florence	128	34	148	26	24	7	Sawyer	554	42	583	33	21	11
Fond du Lac	3709	22	3385	22	0	67	Shawano	1485	22	1368	22	0	64
Forest	402	35	356	34	3	63	Sheboygan	4113	21	4058	17	19	22
Grant	1862	24	1602	20	17	26	St Croix	2456	18	2246	14	22	10
Green	1257	20	1166	16	20	18	Taylor	798	20	678	19	5	55
Green Lake	656	20	604	19	5	57	Trempealeau	1092	25	989	18	28	3
Iowa	899	20	810	20	0	66	Vernon	1002	19	1023	14	26	4
Iron	188	34	205	20	41	1	Vilas	614	37	524	28	24	6
Jackson	651	29	586	27	7	49	Walworth	2930	23	2949	20	13	31
Jefferson	2569	25	2621	20	20	17	Washburn	467	26	471	24	8	45
Juneau	889	31	868	28	10	40	Washington	4166	18	4289	15	17	24
Kenosha	6444	29	6074	23	21	13	Waukesha	12130	15	12380	12	20	14
Kewaunee	682	16	648	16	0	65	Waupaca	1968	27	1835	23	15	29
La Crosse	4186	21	3846	14	33	2	Waushara	722	28	690	29	-4	69
Lafayette	681	17	536	16	6	52	Winnebago	5802	22	5458	20	9	43
Langlade	739	30	661	28	7	51	Wood	3130	23	2801	21	9	44
Lincoln	1033	26	1914	28	-12	72	**Total Smokers**	48102	22.3	38302	18.8	15.7***	NA
Manitowoc	3138	23	2794	20	13	32							
Marathon	5000	17	4855	15	12	35	**Total Births**	215338	NA	202910	NA	NA	NA
Marinette	1367	27	1377	24	11	37							

NA = Not applicable
*** Significant at P<.001

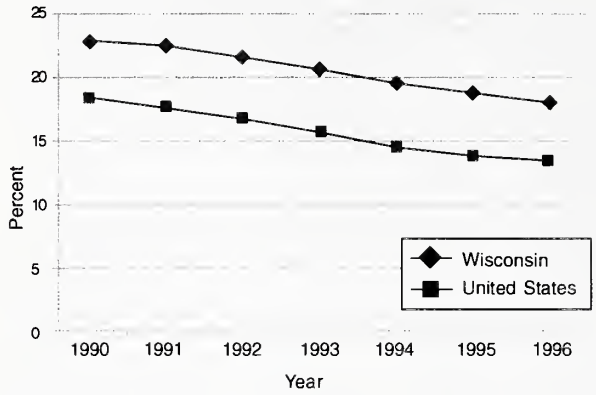
RESULTS

The smoking rates among pregnant women in the United States and Wisconsin have gradually decreased during recent years. The National Center for Health Statistics, Centers for Disease Control and Prevention, recently reported that the national and Wisconsin rates of smoking during pregnancy decreased in the 1990s. The United States smoking rate for pregnant women decreased from 18.4% in 1990 to 13.6% in 1996.[6] In Wisconsin, the rate of women who smoke during pregnancy has consistently been about 4 percent points above the national rate (Figure 1).[6] In 1990, 22.9% of women who were pregnant in Wisconsin smoked; this rate declined to 18.2% in 1996 (significant at P <.001).[6-7]

Overall, in Wisconsin, smoking rates during pregnancy were higher in both 1990-1992 and 1994-1996 among women who were younger, unmarried, American Indian, or African American; received late or no prenatal care; and did not graduate from high school (Table 1).

Table 1 compares the percentage change in maternal smoking between 1990-1992 and 1994-1996 by selected individual characteristics. There were significant decreases for almost all groups. Smoking decreased in all maternal age groups from 1990-1992 to 1994-1996. The largest percentage decrease occurred among women 25-29 years of age, followed by women 30-34 (both significant at P<.001). The decreases in smoking for married and unmarried women were also significant at P <.001. Smoking decreased in all race/ethnicity groups; the largest decrease was among Hispanic women (significant at P <.05); the only racial group that

Figure 1. Percentage of births in which the mother smoked during pregnancy, United States and Wisconsin, 1990-1996



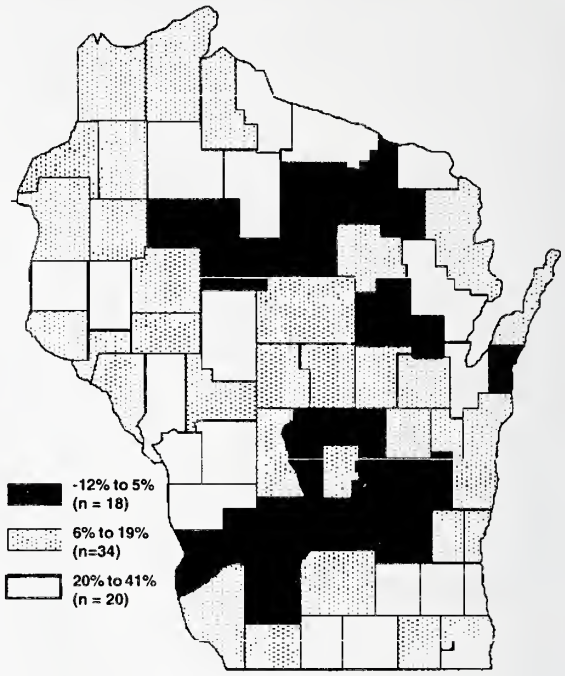
Sources: Center for Disease Control and Prevention. *Report of Final Natality Statistics, 1996* Monthly Vital Statistics Report 1998; 46(11-suppl); and Wisconsin resident birth certificates, Wisconsin Bureau of Health Information

did not have a significant decrease was American Indian. Among categories of prenatal care utilization, women with no prenatal care had the smallest decrease; women who received prenatal care in the first, second (both significant at $P < .001$), or third trimester ($P < .05$) all had significant decreases. Although women who graduated from college had the greatest percentage change in smoking, it was not significant. However, the decreases for the other education groups were significant.

Table 2 shows the results of this comparison for all 72 counties in Wisconsin. Overall, maternal smoking in Wisconsin declined from 22.3% in 1990-1992 to 18.8% in 1994-1996; a 15.7% change (significant at $P < .001$). Sixty-three Wisconsin counties showed a decrease in the proportion of pregnant women who smoked in 1990-1992 compared with 1994-1996; four counties showed no change; there were five counties where the percentage of pregnant women who smoked increased. The county rank for percentage change is shown alphabetically from highest (1) to lowest (72); for example, Iron County, number 1, had the largest percentage change (41%) from 1990-1992 to 1994-1996, and Lincoln County, number 72, had the smallest percentage change (-12%).

Figure 2 shows three groups of the percentage change for Wisconsin counties. There was some regional variation in maternal smoking rates by county. Most counties show progress towards declining rates, indicated by the shaded and white areas on the map. Almost half (34) of the counties were in the middle range of change (6% to 19%) and distributed across the state from the northeast to the southeast with several counties in the northwest and a few counties in the southwest. In the northern part of the state, many of the counties with the largest percentage changes in declining rates were

Figure 2. Percentage change in maternal smoking by county, Wisconsin, 1990-1992 compared with 1994-1996



Source: Wisconsin resident birth certificates, Wisconsin Bureau of Health Information

adjacent to counties with the least amount of change. The central part of the state has counties that fell mostly into the middle range, with a few counties in the upper and lower ranges. Many of the rural counties along the Wisconsin River were in the group with the least amount of change (-12% to 5%). Also, non-metropolitan counties, adjacent to each other in the south, central and north central had the least change. The counties with the greatest change (20% to 41%) were metropolitan counties located in the west, south, southeast, and northeastern parts of the state.

DISCUSSION

It is encouraging that the percentage of pregnant women who smoke has declined among women of different ages, races and education levels in Wisconsin. However, the greatest decreases in smoking occurred among the more educated women. In addition, although most counties showed decreases, the non-metropolitan counties showed the least change. Smoking remains unacceptably high among women of all ages, races and ethnicities. Unfortunately, these data show Wisconsin maternal smoking rates are still above the federal *Healthy People 2000* and Wisconsin Public Health Agenda for the Year 2000 goals of less than 10% of women smoking during pregnancy.[9,10] A combined intervention strategy using both the medical and public

health community is essential to further bring these rates down.

Research shows that primary care providers can implement successful smoking cessation strategies when combined with routine office visits.[11] Primary care providers, including health insurance companies, should also utilize both pharmacotherapy and behavioral interventions to help pregnant women quit smoking. Furthermore, effective evaluation of these strategies is necessary in order to determine the intervention success beyond postpartum.

Community interventions have also proven effective. A recent study found that comprehensive community-based interventions are effective in decreasing tobacco consumption.[12] For example, the Wisconsin ASSIST Project has established a statewide network of community-based coalitions whose activities extend into about 50% of the state. These coalitions conduct tobacco prevention and control activities, ranging from educating the public about the dangers of tobacco use, to the benefits of clean indoor air policies in public areas. The steady increase in both public and private policies which vary from protecting non-smokers from the harmful effects of passive tobacco smoke, to restricting youth access to tobacco products, testify to the effectiveness of community-based efforts in Wisconsin.[13] But more work needs to be done.

Both the medical and public health community must continue to forge new partnerships with state and community-based organizations, especially as new prevention funds become available. Proven prevention, educational and cessation strategies must be implemented and evaluated. And the health community must continue its work to encourage not only women, but also all citizens, to adopt healthy, tobacco-free lifestyles.

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Helping Wisconsin Women Quit Smoking: A Successful Collaboration

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ABSTRACT

The cost of treatments for tobacco dependence frequently presents a financial barrier to their use. To overcome such barriers, the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, the McNeil Consumer Healthcare, and the University of Wisconsin Center for Tobacco Research and Intervention collaborated in an initiative to distribute nicotine patches to Wisconsin women at no cost. As a result of this collaborative effort, approximately 19,000 women received a 6-week course of Nicotrol Patches. To evaluate the effectiveness of this initiative, a sample of 500 recipients were contacted and surveyed by telephone 6 months after receiving their patches. Approximately 22% of these women reported total abstinence at 6 months, and another 77% reported they had reduced their smoking. At follow-up, women who had successfully quit rated their health status significantly better than women who were still smoking. More than 99% of respondents recommended that the program be repeated. Extrapolating the observed abstinence rate to the 19,000 patch recipients, an estimated 4000 Wisconsin women successfully quit smoking as a result of this program.

INTRODUCTION

The deleterious health effects resulting from tobacco use were first widely reported over 35 years ago in the first *Surgeon General's Report on the Health Consequences of Smoking*.[1] Since that time, smoking prevalence among adults in the State of Wisconsin has declined, falling from about 45% in the early 1960s to about 25% today. This decline has varied, however, based on demographic characteristics. In particular, smoking among women has declined at a rate only about one-fourth of that observed among men.[2] As a result, an estimated 440,000 women in our state currently smoke (22% of adult women), and lung cancer mortality rates, which are declining among men, will continue to rise among Wisconsin women over the next decade.[3] In Wisconsin, more women now die from lung cancer caused by smoking each year than die from breast cancer.

More than 70% of Wisconsin smokers have expressed a desire to quit, and over one-third attempt to quit each year.[4] Unfortunately, only about 6% of those who attempt to quit each year do so successfully, in part because they try to quit on their own (i.e., "self-quit"). In contrast, recent federal guidelines[5] urge smokers to utilize brief counseling and FDA-approved pharmacotherapy such as nicotine replacement therapy (NRT) or bupropion SR in their quit attempts. Cost has been cited as one reason that smokers don't utilize these more effective treatments.[6]

To confront these barriers and help Wisconsin women quit smoking, the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, McNeil Consumer Healthcare, and the University of Wisconsin Center for Tobacco Research and Intervention (UW-CTRI), collaborated on an initiative designed to distribute nicotine patches at no cost to women in Wisconsin who were motivated to quit. This paper describes the results of that initiative.

METHODS

In December 1998, approximately 800,000 Nicotrol Patches were donated by McNeil Consumer Healthcare as a non-restricted grant to the UW-CTRI. The patches were then bundled into approximately 19,000 nicotine patch kits, each consisting of a 6-week course of patch therapy consistent with FDA approved labeling. In collaboration with the Wisconsin Women's Health Foundation and the Wisconsin Bureau of Public Health, UW-CTRI embarked on an effort to distribute these kits free of charge to Wisconsin women.

Each patch kit contained forty-two 15 mg nicotine patches, a 6-week course of treatment. This included a starter kit consisting of 2 weeks of patches packaged with an informational audio cassette and 2 refill kits containing patches for the remaining 4 weeks. In addition to the package insert instruction sheet, a pamphlet entitled "You can stop smoking," published by the United States Agency for Health Care Policy and Research (AHCPR),[7] was provided to recipients.

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Finally, information on other women's health issues including breast cancer, osteoporosis, domestic violence, depression and cardiovascular disease, was provided by the Wisconsin Women's Health Foundation.

Over a 2-day period in February, 1999, Sue Ann Thompson, First Lady of the State of Wisconsin and President of the Wisconsin Women's Health Foundation, and Dr. Michael Fiore, Director of the UW Center for Tobacco Research and Intervention, traveled to the five health regions of Wisconsin (Northern-Rhinelander, Northeastern-Green Bay, Southeastern-Milwaukee, Central-Madison, and Western-La Crosse) to promote the availability of the nicotine patch program at no cost to women who wanted to stop smoking. These announcements were made in concert with local health officials. In each health region, a news conference was held, resulting in extensive television, radio, and local print media coverage of the program. These news conferences also provided information regarding locations where patches were available for pick-up. The patch kits were available at the county health offices of each region and at other health-care settings. Prior to accepting the nicotine patches, the women were asked to read and sign a data sheet that included demographic information, confirmation of being at least 18 years of age, a recommendation to use the patches only as described in the instructions included in the patch boxes, specific instructions to not use the patches if pregnant and to not smoke while using the patches, and permission to contact them 6 months later for a follow-up survey.

About 19,000 Nicotrol Nicotine Patch kits were distributed and approximately 5000 participants returned data forms to the UW-CTRI where the information was entered into a data base including health region information based on address zip codes. This low return rate of the data forms was primarily a result of the forms not being available at many patch distribution sites and incomplete mailing of the data forms to the UW - CTRI. A random sampling procedure was then used to obtain 100 successful telephone follow-up contacts per region. A total of 500 surveys were completed statewide.

Follow-up contact was made by telephone. Five unsuccessful attempts at telephone contact were made before selecting another participant. To obtain 500 successfully completed surveys, contact with 727 randomized individuals was attempted. From those attempts, 227 individuals were not successfully contacted because of no answer after 5 attempts (42%), disconnected service (22%), moved (15%), or refusal (14%). Participants were queried regarding their past and current tobacco use. They also were asked about their use of the free nicotine patches and their perception of their usefulness in promoting smoking cessation.

Table 1. Sociodemographic data.

Age (years)	N	(%)
< 20	4	(0.8)
20-29	73	(14.6)
30-39	137	(27.4)
40-49	149	(29.8)
50-59	84	(16.8)
60-69	40	(8.0)
70+	13	(2.6)
Total	500	(100)
Race/Ethnicity	**N**	**(%)**
White	484	(97.0)
Hispanic	1	(0.2)
Native American	5	(1.0)
African American	8	(1.6)
Asian	0	(0)
Other	499	(100)
Education	**N**	**(%)**
< High School	34	(6.8)
High School Degree	255	(51.2)
Some College	163	(32.7)
College Degree	46	(9.2)
Total	498	(100)

Means, standard deviations, and percentages were computed for the overall sample. For selected comparisons involving continuous-level variables, two-sided t-tests were computed to test for differences between groups. When an independent sample t-test was used, equal variances were not assumed. Significance was considered to be achieved at $p<0.01$.

RESULTS

There was a high response rate to the statewide announcements of the patch program. Ultimately, more than 19,000 nicotine patch kits were distributed to Wisconsin women, with about 90% of those kits picked-up within 30 days of the initial announcements. Data forms were received from 5162 recipients (27%), giving UW-CTRI permission to obtain follow-up information. Of these women, 500 (100 from each of the five health regions) were then surveyed by telephone at 6 months.

Sociodemographic data for the 500 respondents is presented in Table 1. Most respondents were between age 20 and 59 with the average age of 43 years. Ninety-seven percent of respondents were white and almost 60% had a high school education or less. Over 50% lived in households where children resided.

The average number of years participants had smoked was 23 (Table 2). Most women smoked between 10 and 20 cigarettes per day, (mean = 22 cigarettes per day). Over 85% of the women had previously attempted to quit smoking, with almost half reporting 3 or more previous quit attempts. Prior to

Table 2. Smoking History

Year Smoked (years)	years	(%)
< 10	62	(12.4)
10-19	115	(23.0)
20-29	167	(33.4)
30-39	91	(18.2)
40-49	50	(10.0)
50-59	13	(2.0)
60-69	2	(0.4)
Total	500	(100)
No. of Cigarettes Per Day, Prior to Receiving Patches	**cigs/day**	**(%)**
< 10	23	(4.6)
10-20	347	(69.4)
21-30	72	(14.4)
31-40	45	(9.0)
> 40	13	(2.6)
Total	500	(100)
Previous Quit Attempts	**attempts**	**(%)**
0	66	(13.2)
1	94	(18.8)
2	96	(19.2)
3	98	(19.6)
4	44	(8.8)
5	33	(6.6)
6-9	23	(4.6)
10+	46	(9.2)
Total	500	(100)
Urged by Healthcare Provider to Quit	**N**	**(%)**
Yes	282	(56.7)
No	215	(43.3)
Total	497	(100)

Table 3. Utilization of Nicotine Patches, Remaining Patches, and Counseling

ALL SUBJECTS		
Utilized Patches	N	(%)
Yes	417	(83.4)
No	83	(16.6)
Total	500	(100)
Abstinent at Follow-Up	**N**	**(%)**
Yes	109	(21.8)
No	388	(78.1)
Total	497	(100)
SUBJECTS STILL SMOKING		
Any Patches Left	N	(%)
Yes	283	(73.1)
No	104	(26.9)
Total	387	(100)
Planned to Use Remaining Patches for a Later Quit Attempt	**N**	**(%)**
Yes	253	(90.0)
No	28	(10.0)
Total	281	(100)
Would Free Counseling be Important in Making Another Quit Attempt	**N**	**(%)**
Yes	166	(44.5)
No	207	(55.5)
Total	373	(100)

picking up the patches, only 56.7% of the women reported that they had been urged by a health care provider to stop smoking.

Of the 500 women surveyed, 83.4% reported that they had used the nicotine patch kit patches; 21.8% (109 women) reported that they were totally abstinent from smoking at 6 months.

Of the 387 women surveyed who were still smoking, 283 (73.1%) reported having some nicotine patches left. Among these, 253 women (90%) stated they planned to use the remaining patches during a future quit attempt. Of the 373 women who responded to this query, free counseling was considered important by 144 women (44.5%).

A number of factors were associated with successful cessation. Individuals who successfully quit used the patch for a longer period of time than women who were smoking at 6 months (means = 4.8 versus 3.4 wks, respectively, $p<0.001$) (Table 4). In addition, successful quitting was associated with improved self-reported health status. At follow-up, women who had successfully quit rated their health significantly better than did women who were still smoking (7.4 versus 8.0, respectively, on a scale where 1 is poor and 10 is excellent, $p<.001$). Both groups had reported similar health ratings at baseline. Finally, women who were still using tobacco at 6 months reported that their smoking had declined significantly since the program had begun (from mean of 22.2 at baseline to 16.4 at 6 months, $p<.001$).

Participant satisfaction with the program is shown in Table 5. Overall satisfaction was high with a large majority of recipients reporting that the free nicotine patch program helped them make a quit attempt (87.6%). Almost everyone indicated that she would recommend the program to friends and that the free nicotine patch program should be repeated in the future (99.0% and 98.8% respectively).

DISCUSSION

In an innovative program designed to encourage smoking cessation among women, the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, McNeil Consumer Healthcare, and the University of Wisconsin Medical School's Center for Tobacco Research and Intervention collaborated in an effort to distribute 19,000 Nicotrol Patch treatment kits at no cost to Wisconsin women who wanted to quit smoking. Among a sample of 500 of these women contacted 6 months later, approximately 22% reported they had successfully quit smoking. Extrapolating this cessation rate to the total population of program participants, approximated 4,000 Wisconsin women quit smoking as a result of this program. The 21.8% cessation rate achieved by these women compares very favorably

with nicotine patch success rates reported in the literature [8] and is markedly better than success rates achieved when individuals attempt to quit on their own. Another notable finding was that women who had not successfully quit reported that they had decreased the number of cigarettes they smoked each day (from an average of 22.2 to 16.4 cigarettes per day). If sustained, this decrease might be beneficial in two ways; first, it might decrease the health risks from tobacco use that are related to smoking rate; second, this decrease may increase women's success in subsequent quit attempts.

The program particularly targeted socioeconomically disadvantaged women for whom cost barriers may prevent the purchase of effective therapies such as the nicotine patch. While we did not collect data on the economic status of participants, most patch recipients had a high school education or less, a factor correlated with lower income. Moreover, 50% of patch recipients had at least one child in their household, suggesting that the health benefits of such a program may extend to the smoker's family.

This program also provides population-based experience regarding interest in adjuvant counseling as well as the effectiveness of the nicotine patch when used without formal counseling. While it has been documented that intensive counseling improves cessation outcomes when used with nicotine patches, many smokers have been unwilling to participate in such counseling.[8] In this program, about half of Wisconsin women reported that they would be receptive to cessation counseling if it was readily available.

Survey data also documented that women who successfully quit were more likely to have used the patches for a longer period of time. This dose-response finding was observed for this population of women who were given enough patches to last 6 weeks. Previous data suggest that no increased therapeutic benefit is observed when patch treatment is extended beyond 8 weeks.[8]

Over 85% of the women surveyed had made at least 1 and almost 50% had made at least 3 quit attempts prior to participating in this program. A history of frequent unsuccessful smoking cessation attempts has been commonly reported in the literature.[9,10] These data attest to the nicotine dependence of the women who participated in this research.

The results also highlight a previously reported lost opportunity–the lack of universal intervention by health care providers with smokers during their health care visits. It has been well documented that even brief counseling from a health-care provider can increase smoking cessation rates significantly.[11] It was disappointing to note in this survey that only 56.7% of patch recipients reported ever being urged to stop smoking by a health-care provider. Research suggests that both clinician education as well as institutional changes (such as recording smoking status with the vital signs[5]) can increase clinician intervention rates.

Table 4. Comparison of Time of Patch Use, Quit Time, Cigarettes Per Day, and Ratings of Current Health. (* p< .001; Non-Smokers compared to Smokers for - Time of Patch Use, Quit Time, and Rating of Current Health; Past Week compared to Prior To Program for - Cigarettes Per Day of Smokers)

	Non-Smokers	Smokers
Time of Patch Use (wks)	4.8* wks	3.4 wks
(Respondants: Non-smk 103, Smk 311)		
Quit Time (wks)	18.5* wks	4.6 wks
(Respondants: Non-smk 103, Smk 312)		
Cigarettes Per Day		
Past Week	0 cig/ day	16.4* cig/day
Prior To Program	22.0 cig/ day	22.2 cig/day
(Respondants: Non-smk 109, Smk 388)		
Rating of Current Health		
10 pt. scale; 1=poor, 10=good	8.0*	7.4
(Respondants: Non-smk 109, Smk 388)		

Table 5. Participant Satisfaction

Do You Feel the Free Patches Helped You Make a Quit Attempt	N	(%)
Yes	366	(87.6)
No	52	(12.4)
Total	418	(100)
Did the Free Patches Help Reduce Your Smoking	**N**	**(%)**
Yes	364	(87.5)
No	52	(12.5)
Total	416	(100)
Would You Recommend the Program to Your Friends	**N**	**(%)**
Yes	495	(99.0)
No	5	(1.0)
Total	500	(100)
Should We Run the Program Again	**N**	**(%)**
Yes	494	(98.8)
No	6	(1.2)
Total	500	(100)

Overall, the participants expressed strong satisfaction with this free nicotine patch program. Greater than 97% indicated they would recommend the program to their friends and that the program should be repeated in the future. In addition, over 85% indicated that the program had helped them to make a quit attempt or reduce their previous level of smoking.

Certain limitations of the study should be highlighted. First, the population surveyed was homogeneous from a racial and ethnic perspective; more than 95% were white. Therefore, it would be inappropriate to generalize these findings to non-white populations. Second, data forms providing demographic information

and permission to follow-up were received only from about 27% of the 19,000 women who picked up free patches. This may have resulted in a selection bias as this group of patch recipients may have differed in a systematic way from other patch recipients or smokers in general. Third, follow-up was possible only among those patch recipients who had access to a home telephone. However, this impact would be modest as over 97% of the occupied housing units in Wisconsin has one or more telephones. In addition, the women who were available for the phone follow-up surveys may have differed from women who could not be contacted. Finally, no biochemical verification of abstinence was used in this study. Research suggests that people may modestly over-report abstinence in the absence of biochemical verification.

In summary, a collaborative effort between the Wisconsin Women's Health Foundation, the Wisconsin Bureau of Public Health, McNeil Consumer Healthcare, and the University of Wisconsin Medical School's Center for Tobacco Research and Intervention resulted in the distribution of Nicotrol Patch kits at no cost to over 19,000 women in Wisconsin. As a result, an estimated 4000 women successfully quit smoking. In addition, women who were not abstinent had significantly reduced the amount that they smoked. The vast majority of women were very satisfied with this initiative and wanted the program repeated.

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Michael J. Dunn, MD

Dean's Corner

MCW Placing Emphasis on Spreading the Benefits of Clinical Research

by Michael J. Dunn, MD, Dean and Executive Vice President, Medical College of Wisconsin

Clinical research completes the process of translating scientific advances into new treatments. At the Medical College of Wisconsin, we are placing greater emphasis on conducting clinical research and training physicians to be skilled clinical researchers. If there is an Achilles heel in our training of physician-scientists, it is that we do not prepare physicians sufficiently to function as scientists for either translational research or studies aimed at improving treatment outcomes.

At the Medical College of Wisconsin, we are taking steps to effect a dramatic increase in the amount of clinical research we conduct and to spread the benefits of participating in clinical research throughout the state. The expansion of research statewide is a goal the Medical College of Wisconsin shares with the UW Medical School. We identified this in our joint report to Blue Cross & Blue Shield United of Wisconsin as one of the needs to be addressed by the landmark gift Blue Cross is making to both medical schools to improve public health in Wisconsin.

Our new Clinical Trials Office was jointly established last fall by the Medical College of Wisconsin and Froedtert Hospital to facilitate expansion of experimental therapy protocols. This office provides key services to faculty researchers conducting industry-sponsored clinical trials, including outreach efforts to attract study participants. While federally-funded clinical research remains an important component for the Medical College as an academic medical center, we are adapting to marketplace reality and equipping our faculty to be more responsive to the needs of the pharmaceutical and biotechnology industry.

Nationally, fewer than 5 percent of eligible patients volunteer for clinical studies, often due to a lack of knowledge about the opportunities for participation. The new Medical College and Froedtert Clinical Trials Office will use the Internet to make available information about ongoing trials at the Medical College and inform physicians throughout Wisconsin searching for ways their patients can receive innovative therapeutics before they become widely available. Information on selected trials at the Medical College is available at *http://healthlink.mcw.edu/clinical-trials*. Plans are underway to make this listing comprehensive.

The Medical College's General Clinical Research Center (GCRC) has been the nexus of clinical research at the Medical College since its establishment 38 years ago. Gabriele E. Sonnenberg, MD, Professor of Medicine, is the GCRC Program Director. She and other Medical College faculty will be working closely to use the resources of this facility – research space, nursing staff and informatics capabilities – most effectively for federally-funded, as well as industry-sponsored, trials.

A five-year Clinical Research Curriculum award from the National Institutes of Health has enabled us to establish the Clinical Research Scholars Program. Leadership is provided by Jane Kotchen, MD, MPH, Director and Professor of Epidemiology; Ahmed Kissebah, MD, PhD, Chief and Professor of Endocrinology, Metabolism and Clinical Nutrition; and Deborah Simpson, PhD, Associate Dean of Educational Services. This program enrolled its first class of 12 junior faculty members and senior fellows in January. They have been matched with senior faculty mentors who provide individualized, research-related guidance to these promising clinicians.

The two-year curriculum is based on an apprenticeship model that teaches faculty researchers the skills needed to conduct clinical research projects as well as build their careers. I anticipate that the graduates of this program will form the core of a vibrant research community and will, in turn, serve as mentors for others.

Ensuring the effectiveness of services provided to patients goes hand in hand with this emphasis on expanding clinical research. We have established a Center for Patient Care and Outcomes Research under the direction of Ann B. Nattinger, MD, MPH, Chief and Associate Professor of General

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Spreading the Benefits of Clinical Research

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Internal Medicine. This new center within the Medical College's Health Policy Institute will study the best ways to deliver patient care. It will provide resources for those already engaged in medical effectiveness research while encouraging others to enter the field.

While the center is still in its infancy, Dr. Nattinger envisions assembling a group of community-based primary care practices that would collaborate with our researchers. Involving community physicians in this way will bring the research tools and expertise of an academic medical center to bear on studying the impact of practice patterns on clinical outcomes and quality of life for a broader spectrum of patients.

Research drives the advancement of medicine's frontiers. We are serious about conducting translational research and providing physicians the training they need to be competitive in this arena. Increasing the quantity and quality of clinical research means that more Wisconsin patients will enjoy better treatment outcomes and be among the first to reap the rewards of discoveries made in the laboratory.

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The Many Faces of Chronic Disease

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Thomas C. Meyer, MD

Editorial

Public Health Series Take 2: Chronic Disease

by Thomas C. Meyer, MD, WMJ *Medical Editor*

An apology first – to the American Lung Association of Wisconsin (ALAW). In the 1999 May/June issue of *WMJ* we printed the progress report of the Society's Medical Outcomes Research Project (MORP) Adult Asthma Study. In acknowledging financial support for the study, we lumped the research grant from ALAW in with the donations from other sources. Instead, we should have identified the fact that the funding from ALAW was, in fact, a research grant awarded through a peer review process rather than a charitable gift. The SMS was, and still is, grateful for ALAW's thoughtful support. We apologize for our oversight and salute ALAW for its encouragement.

This is the second issue of *WMJ* centering around the 10-year follow-up of the *Healthier People in Wisconsin* report — this time looking at chronic disease. There is a lot of solid stuff in here, not the least of which is John Chapin's second essay on Public Health (p 11) – this time a lucid outline of the funding sources which support the Division of Public Health (DPH). One has difficulty understanding how the Division can maintain a coherent program with the patchwork of funding. Doctor Rumm's review of progress in the three major areas of chronic disease (p 12) highlights the good news (cardiovascular disease, cervical and breast cancers), the "indeterminate" news (prostate cancer, stroke) and the not-so-good news (diabetes). He provides brief descriptions of some current DHFS programs as well: The Wisconsin Diabetes Control Program, The Wisconsin Well Woman Program and The Minority Health Program. In addition, Dr. Rumm's compilation of conclusions reached in past *WMJ* articles related to chronic disease provides a quick reference to these efforts.

Doctor Beatty and colleagues provide compelling arguments that cancer patients should be offered the opportunity to enter a clinical cancer study trial (p 20).

Much of what Dr. Rumm summarizes is expanded in the scientific section — Quenan and Remington (p 34) point out that while the overall cancer mortality rate has declined, it is increasing among those over age 65 and in the black population. The same authors (p 44) draw attention to the disturbing increase in the disparity of diabetes mortality rates between whites and blacks. Russell and colleagues further document the seemingly inexorable increase in obesity among Wisconsin adults (p 53). While one may quibble about their methods being that of self-report and therefore not "scientific," the belief is that self-reported data relating to such items as weight, alcohol intake, and cigarette smoking are always on the "leaner side" than is the true state of affairs. Rumm et al (p 30) present a thoughtful discussion of progress with colorectal cancer but exhort our continued vigilance in its prevention.

We welcomed the manuscript from Lee, a medical student who, along with several experienced colleagues, took on the extensive task of a cost analysis of a community screening for diabetes in a select population (p 39). The problem with these sorts of studies seems to be that one is basing assumptions upon assumptions, which can get very difficult – and quality-of-life issues are difficult to quantify in dollars.

Doctors Cisler and Hargarten provide a viable and readily applicable public health model and strategies to attempt to reduce and prevent alcohol-related problems (p 71). They also suggest roles that may appropriately be taken by the profession.

The review of hypertension in women by Drs. Rangarajan and Kochar is comprehensive and, at times, somewhat alarming (p 65). The authors indicate the concerns about oral contraceptives in women of child-bearing age but are reassuring about the role of hormone replacement therapy after menopause. Equally helpful is the review of treatments for Parkinson's disease by Reynolds and colleagues as they outline the full circle of stereotactic neurosurgical alternatives (p 57).

Finally, Sanfelippo et al draw attention to the occasional patient with Lupus Erythematosis requiring anticoagulation whose prothrombin times are affected by the Lupus Antigen such that the INR is artifactually increased resulting in inadequate anticoagulation (p 62). They suggest that wide fluctuations in INRs during Warfarin therapy in patients with Lupus may suggest investigating a Lupus Antigen as the culprit.

WMJ

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COVER THEME
CHRONIC DISEASE

The top three causes of death in Wisconsin and the nation in 1997 were cardiovascular disease, cancer, and stroke. And while the last decade has seen significant progress in reduction of mortality rates from many chronic diseases, there is still room for improvement. This issue of WMJ, *the second in a series of collaborations with the Wisconsin Division of Public Health, explores some of the measures being taken to reduce the impact of chronic disease in Wisconsin.*

Cover design by Kendi Parvin, *WMJ* Managing Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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Ethics and cost-effectiveness can raise quality of care

Thanks to Dr. Stark for his response, *Who Manages Care? Counterpoint (WMJ 99;2:13)*, to my editorial *(WMJ 98; 8:10)*. I don't think that we have any real disagreement. Let me explain.

Doctor Stark disagrees that "...the control of the health care system by these 'other stakeholders' is either inevitable or appropriate." Nowhere in my editorial did I state that stakeholders other than physicians should or inevitably will be in control of health care. My "call to arms" is meant to stimulate physicians to fully understand that other stakeholders currently have a real role in health care, and if physicians want to retain or improve their control, they must recognize and work with – as well as sometimes against – these "others."

As Dr. Stark states, "...physicians and organized medicine (should) remain 'reactive' to some of the forces involved in managed care" when they violate the physician's professional ethic and responsibility of caring for patients. However, a very real and justified concern about the economics of health care delivery has led to the development of tools for improving health care quality *while decreasing the cost!* The unstoppable changes underway can be either always reacted to, or, when appropriate, embraced if they improve care!

The difficulty some physicians have seems to be twofold:

- Revolutionary changes underway are viewed as a monolithic threat, and the difference is not understood between improperly administered managed care and use of legitimate improvements in managing health care delivery.
- Patient advocacy for medically necessary care is carried to the extreme of either lying to get the patient something he or she didn't buy with insurance (e.g., revision of a medically unnecessary cosmetic procedure that didn't turn out well but is not affecting health), or demanding that medically unnecessary care be covered by insurance.

I applaud Dr. Stark for presenting his proposals for redesigning the system. His thoughtful response is precisely the initiative needed for physicians to either control or lead the unstoppable changes underway. As he stated, whoever said that "managed care was the future" was obviously wrong – at least the misapplication of some managed care principles has been wrong in the past 10 or more years. However, performance-data feedback to physicians, benchmarking, guidelines, pathways and a number of other developments stimulated by managed care should be recognized and embraced as progress when used in the right way, while discarding the unethical and unacceptable aspects of managed care.

Again, I don't think Dr. Stark and I have any real disagreement. I certainly endorse his final statement: "I...would like to see organized medicine at the forefront of a movement to design a new health-care system that puts patients first and allows physicians to practice medicine *based upon sound science and medical ethics.*" I would, however, add the phrase, "in a system that is *as cost-effective as possible, while maintaining or improving quality.*" If physicians insist on remaining aloof from cost issues, they will, as I have previously stated, be the victims of reform and imposition of detrimental rules by others.

Maynard D. Poland, MD
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Suneeta Gollapurdy, MD
Shannon Harris, MD
Nathan A. Heerey (S)
Dale K. Heuer, MD
Joseph J. Hines, MD
Noah S. Horowitz, MD
Gail S. Kallas, MD
Waqar U. Kashif, MD
Fahim Ud Din Kazi, MD
Farooque S. A. Khan, MD
Joon S. Kim (S)
Jeffrey M. Krawcek, MD
Monika Krzesniak-Swinar, MD
Sarah B. Kuranz, MD
Jose Ari Laraya, MD
Robert J. Lesniak, MD
Belinda V. Leung, MD
Suyan Liu, MD
Teresa L. McNett (S)
Abalo K. Eli Nunyakpe, MD
Martin J. Oates (S)
Francisca A. Olmedo-Estrada, MD
Send H. Ong, MD
Vladimir Osipov, MD
Anthony C. Pagedas, MD
Tracy A. Park, MD
Thomas J. Perlewitz, MD
Eric B. Pifel, MD
Barbara Ann Rain, MD
Mohini S. Rao, MD
Anne M. Rosenberg, MD
Xiulu Ruan, MD
Thomas B. Sanders (S)
Thomas T. Sato, MD
Stacy Ann Sjoberg, MD

Who's in the News

Joseph J. Mazza, MD, and **James C. Opitz, MD,** were recognized for 30 years of service to Marshfield Clinic during the annual Marshfield Clinic Employee Awards Program. **Thomas D. Hinke, MD, James L. Hoehn, MD, Marvin E. Kuehner, MD,** and **Teresa L. Silberman, MD,** were recognized for 25 years of service, while **John A. Campbell, MD, Victor S. Ejercito, MD, Paul G. harkins, MD, Gary J. Janssen, MD, Donald B. Kelman, MD, Paul L. Liss, MD, Richard G. Nash, MD,** and **Robert E. Phillips, MD,** were recognized for 20 years of service.

Joseph Blustein, MD, a medical acupuncturist in private practice in Madison, has become an associate member of the American Academy of Medical Acupuncture. He completed the UCLA MD Acupuncture Program in March. His private practice is open to referrals.

Rebecca Lea Sommer, MD
Matthew B. Sperry (S)
E. Lee Stock, MD
Roy P. Sweeny, MD
Nancy J. Taft, MD
Michael Trias, MD
Kimberlie Ann Ward, MD
Lawrence J. Williamson, MD
Lei Yao, MD

Oconto
James E. Thill, MD

Oneida-Vilas
Nancy A. Fisher, DO

Outagamie
John E. Ganser, DO

Ozaukee
Michael DeFrank, MD

AMA Awards

The SMS member physicians listed below recently earned the AMA's Physician Recognition Award. They have distinguished themselves and their profession by their commitment to continuing education, and the SMS offers them its congratulations.

John F. Andrews, MD
George E. Breadon, MD
Norman D. Buebendorf, MD
John C. Christianson, MD
Richard W. Edwards, MD
David J. Faust, MD
Howard W. Fiedler, MD
Loren C. Fuglestad, MD
Olufowobi S. Gbadebo, MD
Michael I. Goldrosen, MD
Terry L. Hankey, MD
Gary S. Hauke, MD
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David A. Janssen, MD
Sivakami Kangayappan, MD
Thomas A. Keller, MD
Robert Byung Hoon Kim, MD
Ralph A. Kloehn, MD
Mahendr S. Kochar, MD
Julie A. Magnin, MD
William E. Martens, MD
Edwin L. Mathews, MD
Vicki L. Mayer, MD
Sonia C. Mehta, MD
Patricia A. K. Nahn, MD
Reid M. Olson, MD
G. A. Prasad, MD
Robert L. Sellers, MD
John V. Selthafner, MD
Ron H. Stark, MD
John M. Teske, MD

Pierce-St. Croix
Matthew C. Clayton, MD

Portage
Brian M. Belson, MD
Brenda Ann Blohm, MD
Jeffrey J. Jones, MD
Kenneth Kim Oh, MD
Terri A. Pritzl, MD
Roxanne Richards, MD

Racine
Tedd P. Cain, MD
Rhonda S. Ganansky, MD
Pradeep Gopi Kumar, MD
Shih Sing Liu, MD
Steven L. Rabinowe, MD

Rock
Mallik V. V. A. S. Chaganti, MD
Krzysztof Goetzen, MD
Anshu Luthar, MD
James J. Mozzillo, MD
Timothy Reid, MD

Rusk
Joseph P. Holt, III, MD

Shawano
Gregrey G. Hiltgen, MD
Phillip S. Yee, MD

Sheboygan
Charles B. Black, MD
Daniel A. Peterson, MD
Mark Ulrickson, DO

Taylor
Jacqueline Ekwueme, MD
Theodore S. Parins, MD

Washington
Jerome B. Buboltz, MD

Waukesha
Siamak Baghai Arassi, MD
Norman D. Gramstad, DO
Harlan A. Stueven, MD

Winnebago
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WMJ

Call for Papers, Reviews, Commentary

In 2000, *WMJ* will examine issues related to public health in Wisconsin. The *WMJ* Editorial Board is seeking original manuscripts related to these themes:

End-of-Life Issues
(to be printed in September)
Deadline for peer review papers: July 15
Deadline for other submissions: August 1

Geriatric Health
(to be printed in October)
Deadline for peer review papers: August 15
Deadline for other submissions: September 1

Environmental Health
(to be printed in November)
Deadline for peer review papers: September 15
Deadline for other submissions: October 1

Injury Prevention
(to be printed in December)
Deadline for peer review papers: October 15
Deadline for other submissions: November 1

In addition, general scientific papers are always appreciated and will be published on a regular basis. All submissions should conform to *WMJ* requirements. For further information contact Kendi Parvin, Managing Editor at 608.257.6781, toll-free at 800.362.9080, or via e-mail at: kendip@smswi.org. Instructions to authors are available on the SMS website at www.wismed.com.

In Remembrance

Belfus, Frank H., MD, 84, of Mequon, passed away May 2, 2000. He earned his medical degree from the University of Chicago. He served his internship at Milwaukee Hospital, specializing in internal medicine, then went on to a residency at Columbia Hospital.

Doctor Belfus served in the US Navy. He was a member of the Milwaukee Academy of Medicine and the American Society of Internal Medicine.

Doctor Belfus is survived by his children, David (Donna), Elizabeth (Rick) Schmidt, Barbara and Donald (Sherry); grandchildren, Mary (Peter) Gushee, Andrea (John) Wallus, Wendy (Mark) Peterson, Valerie (William) Schneider, Jennifer Schmidt, Sarah and David Quackenbush and Adam Belfus; and four great-grandchildren.

Conway, John D., MD, 80, of Milwaukee, passed away March 13, 2000. He earned his medical degree from Marquette University, served his internship at the US Naval Hospital, Great Lakes, IL, and completed residency at the US Veterans' Hospital, Wood, WI.

He served his country during World War II in the US Navy and was a longtime staff member of St. Mary's and Columbia Hospitals, Milwaukee. He was a founding member of the medical team of St. Mary's regional burn center and founder and President of the Northpoint Medical Group.

Doctor Conway was the recipient of the Distinguished Alumnus Award from Marquette University in 1999, a life member of the State Medical Society and a member of the 1998 SMS Fifty Year Club. He was also a fellow of the American College of Surgeons and the Wisconsin Surgical Society, certified by the American Board of Surgery and a member of the Wisconsin Surgical Society. He was a founding member of the American Burn Association and the International Society for Burn Injuries as well.

Doctor Conway is survived by his wife, Geraldine "Gerry"; his children, Michael (Jane), Patricia (Richard) Hayward, James, Joan (Tim) Hogan, Colleen (Richard) Schumaker, Paul (Monica) and Therese (Ken) Mahannah; and 23 grandchildren.

Hammes, George R., MD, 88, formerly of Wausau, passed away February 26, 2000 in Florida. He earned his medical degree from the University of Wisconsin Medical School and served an internship at St. Francis Hospital, La Crosse. He was a general practitioner in Seneca, WI before moving to Wausau in 1946. He practiced medicine with the Wausau Medical Center and Wausau hospitals until his retirement in 1981.

Doctor Hammes was a member of multiple medical organizations, life member of the SMS and a member of the SMS 1987 Fifty Year Club.

Doctor Hammes is survived by his wife, Helen; his children, Michael (Peg), of Brookfield, John (Veronica), of Cedarburg, Mark, of Minneapolis, MN, Mary (Roger) Vilwock, of Sun Prairie and Margaret (Peter) Jung, West Lake, OH; stepson, Thomas (Jacquelyn) Tinkham, of Minneapolis, MN; stepdaughter, Nancy (Peter) Hessert, of Wausau; grandchildren, Paul, David, Cornelia, Christina, Alex, Christopher, Joseph, Elizabeth, Andrew, Todd, Christopher, Andrew, Tamara, Lisa, Taylor, David and Mary Jo; and great grandchildren, Mitchell and Benjamin.

Higley, Richard A., MD, 78, formerly of Elm Grove, passed away October 29, 1999 in California. He earned his medical degree from Marquette University Medical School, completed his internship at Milwaukee Passavant Hospital and completed his residency at the Veterans' Hospital in Wood, WI.

Doctor Higley served in the US Naval Reserve for two years. He was associated with St. Joseph's Hospital in Milwaukee and was a member of the Wisconsin Dermatology Society and the Medical Society of Milwaukee County.

Millenbah, Jack D., MD, 77, of Merrill, passed away April 5, 2000. He earned his medical degree from Creighton University Medical College, Omaha, NE, in 1946, and in 1950 he opened his private practice in Merrill. In 1970 he joined the Family Medical Clinic in Merrill, where he practiced until his retirement in 1985.

He served with the Fifth Army Medical Unit in St. Louis, MO during World War II. Over the years, he served as President, Vice President and Secretary with the Lincoln County Medical Society and was a life member of the SMS and a member of the 1998 SMS 50 Year Club.

Doctor Millenbah is survived by his wife, Bonnie; his children, Mary Ann (Rick) Penne, of Tilden, NE, Jeff and Jay (Mary Jo), both of Merrill, eight grandchildren, two great-grandsons and sister Mae June (James) Bullis, of Antigo.

Piper, Philip G., MD, 81, of Waunakee, passed away May 5, 2000. He earned his medical degree from the UW Medical School.

He served in the Medical Corps during World War II. He was formerly the Director of Laboratories at Madison General Hospital, Medical Director of the Badger Regional Red Cross Blood Center, Director of the School of Medical Technology at Madison General and its pathology residency program, Associate Clinical Professor

at the UW Medical School and Director of Lab at Edgerton Memorial Community Hospital and Mercy Hospital in Janesville. In addition, he was an Emeritus Fellow of the College of Pathology and a member of the American Society of Clinical Pathology and the International Academy of Pathology.

Doctor Piper is survived by his wife, Margaret; son, David (Debbie) of Madison; stepdaughter, Carolyn (Ray) Stewart, of Waunakee, stepson, James Ruppe, of Waunakee; and step-granddaughter, Kristin.

Smith, Ernest V., MD, 91, of Fond du Lac, passed away January 25, 2000. He was a graduate of Northwestern University Medical School and served his internship at Ancker Hospital In St. Paul, MN. He served as President of the Fond du Lac County Medical Society and was a former chief of staff at St. Agnes Hospital.

Doctor Smith is survived by his wife, Dorothy; his children, Ernie V. (Rae), of Fort Meyers, FL, Stephen L., of Carmel, CA, Richard W., of Indianapolis, IN, Thomas C., of Fond du Lac and Kathryn E., of Little Rock, AR; 10 grandchildren; eight great-grandchildren and his sister, Margaret Bender, of Sun City, AZ.

Start, Armond H., MD, 66, of Tulsa, OK, formerly of Verona, passed away March 30, 2000. He earned his medical degree from the University of Michigan in 1957. He practiced pediatrics in Oklahoma City for 12 years.

After leaving private practice, he received his MPH and worked for the Oklahoma Department of Health. For the past 20 years he has been a full-time physician manager-educator in the field of correctional health care, which included 11 years as Associate Professor in the Department of Family Medicine at the University of Wisconsin Medical School. He was nationally known as a strong advocate for medical reform, belonged to numerous professional organizations and received many awards and honors in the health care field.

Doctor Start is survived by his wife, Judy; his children, Susan Murphy, of Carrollton, TX, Lisa Eldersveld, of Grand Rapids, MI, Carrie Fischer, of Tulsa, OK, Dr. David Start, of Grand Rapids, MI and nine grandchildren.

Whitsitt, Leighton S., MD, 59, of Madison, passed away April 29, 2000. He earned his medical degree and PhD from the University of Michigan Medical School in Ann Arbor. He went on to complete postgraduate specialty training in pediatrics, pediatric cardiology and ophthalmology. He was a staff surgeon with Dean Health Systems and Davis Duehr-Dean since 1987 and served as a Clinical Assistant Professor of Opthalmology at the University of Wisconsin Medical School.

Doctor Whitsitt played a major role in developing the refractive surgery program at Davis Duehr-Dean and in training other surgeons to perform LASIK. He routinely presented papers and instructional courses at national and international refractive surgery conferences.

Doctor Whitsitt is survived by his wife, Jeanne; his daughter, Kim of Los Angeles, CA; his brother, Douglas of Tucson, AZ; and his parents, Selman and Gail Whitsitt of San Antonio, TX.

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Guest Editorial

Smoking Status Should Be the Fifth Vital Sign

by Michael Miller, MD

As we go through medical training, we are acculturated to doing things in a standard manner: the patient history and physical has a conventional outline, the handwritten prescription has certain required elements, the "SOAP note" is a format familiar to most physicians and nurses. And we learn that there are some basic steps of the health care encounter that we should always document. What is the patient's chief complaint or reason for being there? What are the patient's vital signs? What is our best description of the patient's problem today?

A basic rule of thumb in medical practice is, "Don't forget the commonplace." So what do we know about the commonplace? We know that obesity, hypertension, malignancy, heart disease, diabetes, depression and alcoholism are chronic illnesses we encounter most often. We know that patients' dietary, physical activity, and substance-use behaviors influence the course of many chronic illnesses. And we know that the *number one* preventable cause of chronic illness in the industrialized world is cigarette smoking.

With these axioms of medical practice in mind, Wisconsin's own Michael Fiore, MD, gave us all a simple and most useful suggestion in *JAMA* a couple of years ago. He suggested that when we see a patient, we should document (or have our medical assistant or nurse document) not only the patient's vital signs, but also the patient's smoking status. The patient's status as a current smoker, former smoker, or never smoker could be recorded in the chart as a fifth vital sign. This information allows a physician to structure a brief behavioral intervention in any office visit: acknowledging the never smoker as a person with lower general mortality risks, commending the former smoker for his or her critically important and difficult behavior change and reminding the current smoker of the need to stop smoking as soon as possible.

At the 2000 SMS annual meeting, delegates adopted a resolution calling for physicians to ask about smoking status at every health care encounter. The reason is not idealistic, it is empirical. Research has documented the efficacy of brief interventions for smoking cessation, made over a series of office visits, in which the physician is consistent and unrelenting in following a simple tetrad of physician behaviors called "The Four A's":

- Ask every patient about smoking.
- Advise the current smoker to quit.
- Assist the patient with written materials, behavioral skill-building, or referral.
- Arrange a follow-up visit to discuss the patient's response to today's advice and assistance.

Wisconsin health care organizations take different approaches to this issue. Some remain in denial or have chosen to avoid it, saying, "There's so much else to do." In contrast, some have assisted their staff in implementing the Four A's by starting with a standard charting format that incorporates the fifth vital sign. For instance, progress notes can be preprinted with a checkbox for "current," "former" or "never" before the word "smoker." Or a stamp can be used by the nurse or medical assistant to begin each new chart entry, including a blank for smoker. Word processing programs can easily be formatted to print data collected by the physician or staff member. And any physician can structure his or her own outline for dictating to begin with a line about smoking status.

Again, the issue isn't simply one of record-keeping. Just as pertinent positives and negatives prompt the skilled clinician to take one path or another

Doctor Miller is the director of Behavioral Services and medical director of Adult Addiction Services at Meriter Hospital in Madison. An assistant clinical professor at the University of Wisconsin Medical School, Dr. Miller is also an AMA Alternate Delegate and SMS member.

in the diagnostic or therapeutic decision tree, data about smoking status can prompt a powerful but brief intervention with the patient. Positive reinforcement is instrumental in maintaining behavioral changes and in building positive doctor-patient rapport. And physician advice is critical in assisting the "precontemplative" patient—the one who hasn't even begun to think about a needed positive behavior change—to progress to becoming a "contemplative" patient who is considering or preparing for a difficult behavior change. "It's important that you stop smoking"; "I'd like to assist you in stopping smoking"; "I think we should talk again about your smoking"—all these are constructive responses to seeing in the patient's chart that he or she is a current smoker.

Reflecting on this, we all know physicians who are strident about certain issues. Patients often tell us that they can count on Dr. X to always bring up "the smoking thing," so they switch providers or avoid seeing Dr. X. It's time for us all to think about our behavior as physicians: What do we accept in our patients, and what do we avoid? How are we complicit in their denial of their need to change their behavior? Maybe more so, are we in denial of our own need to change the way we interact with our patients around their behavior-related illnesses? If we all present a united front, and patients come to expect that every doctor's visit will include a mention of their smoking status, we will accept the commonness of smoking as a behavior in our patients, accept that it has a profound effect on their lives, and accept that we can do something efficacious about it. Addressing smoking status should become a standard routine of our daily practice.

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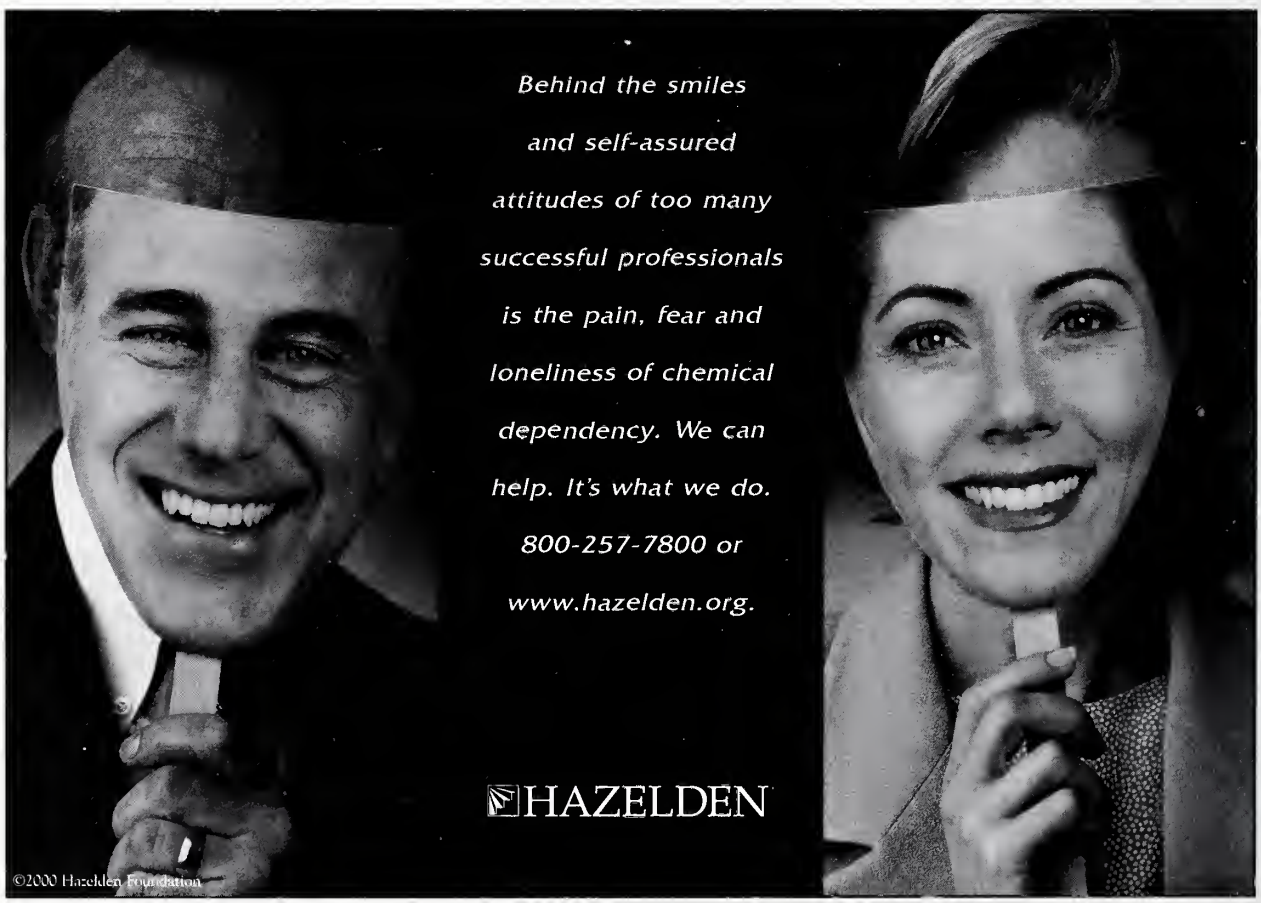


Guest Editorial

Public Health Funding in Wisconsin

by John Chapin, Administrator, Division of Public Health

The funding for public health in Wisconsin comes from a variety of sources: the Wisconsin legislature, the federal government, local government and private contributions from community organizations and foundations. The total dollars that come through the legislature from state general purpose revenue (GPR tax dollars) stands at around $26 million a year. Ironically, that works out to less than the cost of two packages of cigarettes per year for each Wisconsin citizen. Only $5 million of those GPR dollars from the legislature goes to support the operational costs of the Division of Public Health (DPH). The other $21 million supports the 26 different program appropriations enacted by the legislature. These range from radon control programs to diabetes education to women's health.

DPH raises $10 million in program revenue through fees (collected by DPH and other state agencies), and licensure and certification for scores of regulatory programs ranging from restaurant inspection to certification of asbestos abatement workers. This revenue is used to support the operational costs of these regulatory programs.

The federal government, through nearly 60 different programs from nearly a dozen agencies, funds public health in Wisconsin at the level of $95 million a year. Of this, $76 million goes out of state government via DPH to local public health departments, private providers, non-public community-based organizations and universities. About $19 million goes to support DPH activities in these programs.

> "Public Health is a means for protecting and promoting the health of the public through collaborative actions designed to build and sustain healthy people, communities and environments."
>
> *Wisconsin's Turning Point Program*

Local public health departments are supported by nearly $100 million in local property taxes and local program revenue. In every jurisdiction across Wisconsin, local tax support per capita is higher than the state aggregate GPR per capita program support. Some localities support public health with up to $30 per capita, and many fund public health at rates higher than the federal per capita amount.

The recently-enacted Tobacco Control Board is slated to contribute $23 million per year from the tobacco settlement (segregated funds) to smoking prevention and cessation programs. The percentage of those funds to be allocated to community-based public health activities will be at the Board's discretion.

When all state and local tax dollars, program revenue, federal funding and segregated (tobacco) dollars for public health are added together, it totals about $254 million a year. Local tax dollars are the greatest source of Wisconsin dollars; state GPR funds are only 10% of the total. For all public health funding in Wisconsin, that sum is less than the individual annual budget of either of the two medical schools. It is also less than 1% of that spent in Wisconsin on direct health care in all its forms–a little over $50 per capita.

This is not a plea for more public funding but an effort to put into context the level at which public health is funded in Wisconsin. Though few, these dollars have been and are being well spent. They have contributed to a high quality of life for Wisconsin residents. In fact, as David Kindig, MD, suggested in a recent editorial on the consequences of Wisconsin getting so few Medicare dollars compared to other states for equivalent services, it might just be that Wisconsin's public investment in areas outside of direct health care explains how Wisconsin can deliver so much health care and at such a high quality level for so few dollars.

The punchline from this lesson on the economics of public health is that the political agenda of public health needs the support of the physician community. In the battle for additional resources to support an increase in every $99 of direct health care, the allied $1 of public health resources should not be forgotten. It is what pays for the infrastructure of public health on which health care stands.

A decade of improvement in areas of chronic disease

Where Do We Go From Here?

by Peter D. Rumm, MD, MPH; Lynn Quenan, MS; Denise Carty, RN, MS; and Meg Taylor, BSN

At the beginning of the last decade, the public health and medical communities began to respond to the actuality of chronic disease as the major cause of mortality and morbidity in the United States and Wisconsin. In 1996, the top three causes of death in both Wisconsin and the United States were cardiovascular disease, cancer, and stroke (cerebrovascular disease), while diabetes ranked sixth. These conditions remained unchanged in the 1997 age-adjusted mortality rankings on both the national and state levels.[1,2]

As such, chronic disease control and treatment remain a public health priority. This point was recently stated in a review by three experts in this field, "The need for public health involvement in chronic disease control is reflected in the large number of Year 2010 Health Objectives... that address chronic disease issues. To meet this demand, public health professionals must become knowledgeable in the science and practice of chronic disease control."[3]

The last decade has witnessed some significant efforts in this direction. On a national level, the Centers for Disease Control (CDC) changed its name in 1995 to officially include the term Prevention and is beginning to establish major divisions in areas of chronic disease. In Wisconsin, the Department of Health and Family Services (DHFS) recently established a separate Bureau of Chronic Disease Prevention and Health Promotion in the Division of Public Health. In addition, both medical professionals and the general public can obtain statistical information and a number of publications on chronic disease from the Bureau of Health Information in the Division of Health Care Financing. Furthermore, numerous state-based authors contributed excellent articles during the last decade to the *Wisconsin Medical Journal* and other publications or produced public health documents discussing important findings and conclusions in chronic disease. A summary of these articles is displayed in Table 1. We hope this article will provide some insight into past trends and help guide further study in many chronic disease areas in the coming decade.

To build upon earlier efforts, we will review several significant chronic disease mortality trends of the last decade, comparing Wisconsin to the United States. In addition, we will briefly describe three recently implemented programs in DHFS that target areas of chronic disease and health promotion. Finally, we will discuss the key conceptual ideas of the ongoing Wisconsin Turning Point Project that will shape public and legislative policy on chronic disease prevention and control.

Authors are with the Bureau of Chronic Disease Prevention and Health Promotion, Division of Public Health, Wisconsin Department of Health and Family Services (DHFS). Doctor Rumm is Chief Medical Officer and State Epidemiologist; Ms. Quenan is a Public Health Intern (supported by funding from the Department of Preventive Medicine, University of Wisconsin); Ms. Carty is Minority Health Officer; Ms. Taylor is Director.

A Review of Three Major Areas of Chronic Disease

I. Cardiovascular Disease, Ischemic Heart Disease, and Stroke

Despite dramatic declines in mortality from heart disease and stroke in the 1970s and 1980s, at the beginning of the 1990s more than 7 million

Americans were affected by coronary heart disease, and cardiovascular diseases caused more deaths in the United States than all other diseases combined.[1] Figure 1 demonstrates that a substantial decrease in the rate of cardiovascular deaths in Wisconsin has occurred since 1990, exceeding national averages. This decrease has been attributed to a combination of improved prevention and medical therapy.[3]

Despite dramatic declines in mortality from heart disease and stroke in the 1970s and 1980s, at the beginning of the 1990s more than 7 million Americans were affected by coronary heart disease, and cardiovascular diseases caused more deaths in the United States than all other diseases combined.

A similar trend is seen in deaths from ischemic heart disease (Figure 1). Wisconsin mortality rates from ischemic heart disease were slightly below the national rates and followed an encouraging downward trend, similar to the nation, in the first seven years of this decade. Possible factors contributing to this trend include continued screening efforts, improvements in cholesterol treatment, and active work by chronic disease experts at the state and local levels to seek out national and state funding for improved cardiovascular prevention.[4] (Wisconsin plans to apply for new cardiovascular funding from the CDC available this year.)

In contrast, Wisconsin and the United States have seen a leveling of mortality rates from stroke after two decades of steady decrease. As of 1997, Wisconsin exceeded the national median mortality rate for stroke, ranking as the 18th worst state in age-adjusted mortality for this condition[5] (Figure 1). Moreover, as early as 1993, Peterson and Remington stated that Wisconsin was not making progress towards reaching its objective for stroke mortality and called for better awareness, screening efforts and active prevention programs.[6] As such, Rumm and colleagues hope to establish major collaborative preventive programs over the next decade to specifically address stroke and its underlying risk factors (smoking, hypertension, diet and physical activity).

II. Cancer: Breast, Cervical, and Prostate

In an earlier article on this subject, Bastin stated that through 1996 overall cancer mortality in Wisconsin remained below US averages.[7] This trend has continued through 1997 (Figure 2).

Wisconsin recently ranked as the 13th best state in cancer mortality.[5] Factors contributing to this overall ranking include many excellent screening programs, state-of-the-art treatment centers and the state's high rate of insurance coverage.

In 1993, the National Breast and Cervical Cancer Prevention Program was established by the CDC in response to federal legislation. Wisconsin has been an active participant in this program, screening women who meet federal eligibility guidelines for these two cancers. Wisconsin, similar to the rest of the nation, has seen a steady decrease in breast cancer mortality over the first seven years of the decade (Figure 2). Wisconsin recently ranked as the 11th best state in breast cancer mortality, the second leading cancer killer of women.[5] Cherney and Remington attributed this trend to increased mammography (up 32% from 1987-1992), better treatments and increased public awareness.[8]

Cervical cancer is also an important public health topic, and it is estimated that the use of the Papanicolaou smear has reduced mortality from this condition by 70% in the last three decades. Recent studies have confirmed that most (if not all) cervical cancer is directly attributable to the human papillomavirus (HPV). Other important risk factors include early age of sexual intercourse, number of sex partners, socioeconomic status, and cigarette smoking.[9,10]

Knight compared cervical cancer mortality between 1982-1984 and 1992-1994 and showed that rates were declining overall in Wisconsin, but were slightly higher in the 25-44 age group. This was a somewhat paradoxical finding, as this age group was more likely to receive screening. However, Knight postulated that increased incidence and higher rates of HPV infection in this group might have contributed to this mortality trend.[10] Mortality data from 1995-1997 indicate that this trend in the 25-44 year age group has reversed, with this group now having the lowest rate of cervical cancer mortality among Wisconsin women (data not shown). The trend for overall improvement has continued in

Wisconsin, and our state has remained below the national average throughout the decade (Figure 2).

Prostate cancer is the second leading killer of men in Wisconsin and the United States.[1] Trends in prostate cancer mortality for the United States and Wisconsin indicate increasing rates from the 1970s through the 1990s. Haselow and Remington noted that the Wisconsin rate of age-adjusted mortality from this cancer had increased 26% between 1979 and 1994.[11] However, in the past several years, mortality rates have decreased in both the United States and Wisconsin (Figure 2). Several plausible explanations for this fluctuation include increased incidence, better detection/diagnosis and a change in death certificate reporting.[11] It will be important for the public health community to carefully monitor and evaluate the sustainability of this trend.[3,11]

Of particular importance to the discussion of trends in prostate cancer is the national effort during this decade to encourage prostate cancer screening. Despite widespread clinical use of prostate specific antigen (PSA) and/or digital examination, the subject of screening for prostate cancer remains controversial. In 1999, the influential American Cancer Society (ACS) recommended no longer mandating periodic PSA after age 50 for the general population. The ACS policy change was made in response to concerns over significant morbidity with current surgical treatments and the lack of evidence supporting a relationship between screening and a reduction in mortality.[12] Contrary to the ACS policy, three major professional societies, the American Academy of Family Physicians, the American Urological Association, and the American Radiological Societies, continue to recommend periodic screening in men over 50 or earlier based on the presence of risk factors. The US Preventive Task Force (USPTF) currently does not recommend any routine prostate cancer screening, and the American College of Physicians (ACP) recommends that screening decisions be made on an individualized basis. Additionally, the ACP strongly recommends that physicians help enroll eligible men in ongoing clinical studies.[9]

The last decade has seen significant progress in reduction of mortality rates from many chronic diseases on both a state and national level. Moreover, in general, Wisconsin has achieved levels below the United States for mortality.

III. Diabetes

Diabetes mortality in the United States has increased significantly in the past decade (Figure 1), with rates exceeding 18/100,000 in 1997. Although diabetes mortality rates in Wisconsin have also increased in the past decade, the rates remain below those of the nation.

What has contributed to this trend in diabetes mortality during this decade? Remington and Vinicor have suggested a major reason may be a revision of the death certificate in 1989, which facilitated the increased reporting of diabetes as the underlying cause of death. Also contributing to the increased mortality is the continued increase in the incidence of diabetes, especially Type II, largely attributed to changes in diet, obesity and decreased physical activity.[13,14] Yet deaths due to diabetes are often attributed to cardiovascular disease, end-stage renal disease and infections. It is estimated that approximately one-half of diabetes-attributable deaths remain unreported.[3,13,14]

Therefore, diabetes mortality is difficult to utilize as a true statement of progress.[13] Miller recently estimated that the burden of diabetes in Wisconsin remains significant, with over 3600 deaths, 68,000 hospitalizations, and $2.1 billion in direct and indirect costs attributed to the disease in 1996-1997.[15] Vinicor stated that due to increased awareness of diabetes as an underlying cause for amputations, heart disease, end-stage renal disease, blindness and other complications, it will most likely be many years before significant decreases in national mortality and morbidity trends are accomplished.[13]

DHFS Programs Addressing Chronic Disease

I. The Wisconsin Diabetes Control Program

The Wisconsin Diabetes Control Program (DCP) utilizes extensive statewide partnerships to accomplish its goal of improving diabetes care throughout the state.

The DCP is supported financially mainly by the CDC Office of Diabetes Translation, but recently received $94,700 supplemental allocation by state government and in-kind funding exceeding $600,000 from external organizations. The DCP was recently lauded by the CDC for its innovative work with the state's health maintenance organizations (HMOs), and it has become a model for the development of programs in other areas of chronic disease in Wisconsin.[13] It is hoped that the ultimate effect of the DCP's substantial efforts will be to lower both the mortality and morbidity associated with diabetes in Wisconsin.

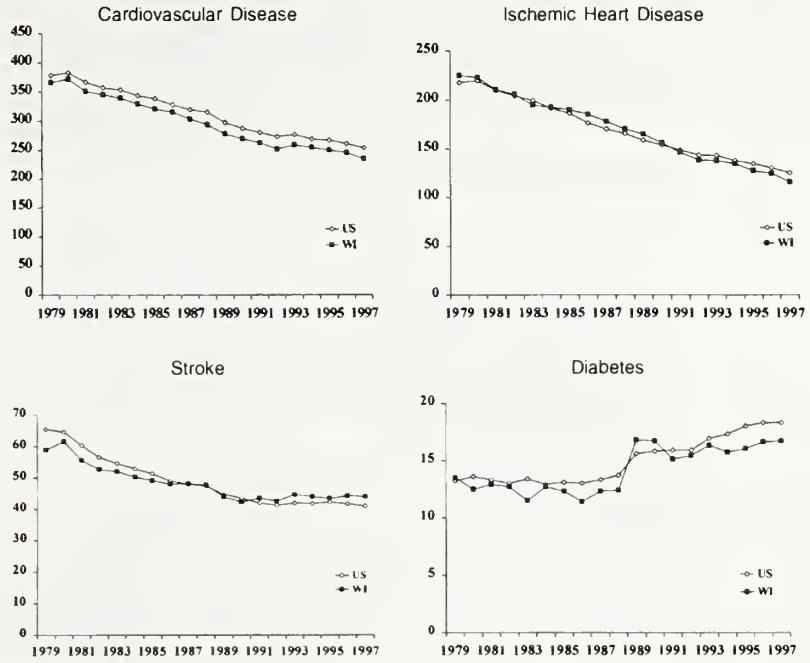
Some of the stated accomplishments of the DCP in the last two years include:[16]Despite dramatic declines in mortality from heart disease and stroke in the 1970s and 1980s, at the beginning of the 1990s more than 7 million Americans were affected by coronary heart disease, and cardiovascular diseases caused more deaths in the United States than all other diseases combined. The DCP has worked in the last two years to address these concerns and sites accomplishments[16] such as:

- Working with all 24 licensed state HMOs on disseminating and implementing the *Essential Diabetes Mellitus Care Guidelines*,
- Collaborating with the Wisconsin Primary Health Care Association to improve care for patients with diabetes in community health centers, migrant health centers and homeless programs,
- Co-sponsoring a Diabetes Leadership Forum and a statewide CME program for physicians and other health care workers,
- Establishing significant community interventions with the Great Lakes Inter-Tribal Council, the Latino Health Organization, Wisconsin Lions, the American Diabetes Association (ADA), the American Heart Association and the National Kidney Foundation,
- Conducting a major flu shot campaign with collaborators (especially the ADA) that distributed over 129,000 pieces of campaign material and 434 press kits, and
- Maintaining an active surveillance and evaluation program and supporting a large scale Diabetes Outcome Research Project.

II. The Wisconsin Well Woman Program

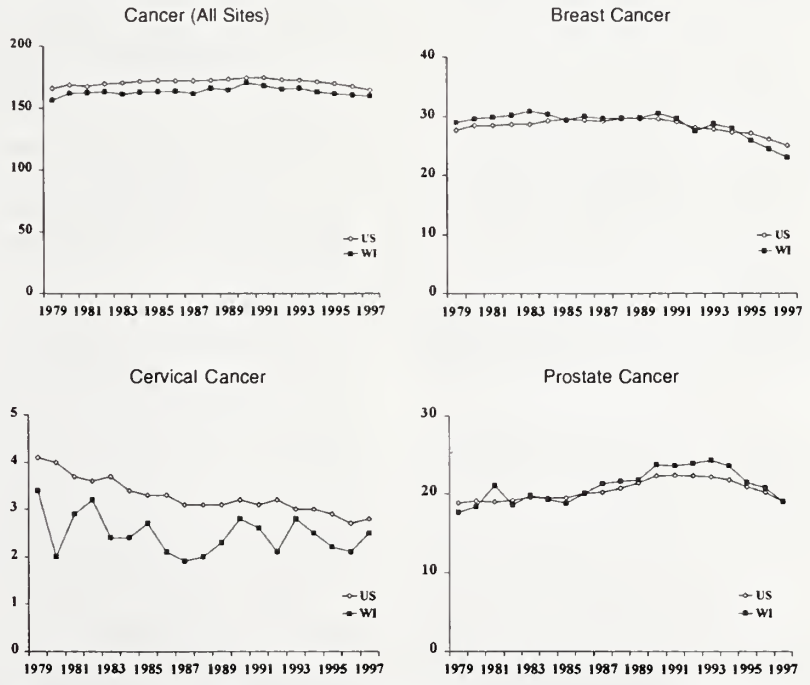
Perhaps the most publicized

Figure 1. Age-Adjusted Mortality for Selected Chronic Diseases, United States and Wisconsin, 1979-1997



Rates per 100,000 population; Age-adjusted to the 1970 US Population; Based on data from NCHS accessed through CDC WONDER using the following ICD-9 codes: Cardiovascular Disease (390-459), Ischemic Heart Disease (410-414), Stroke (340-348), and Diabetes (250)

Figure 2. Age-Adjusted Mortality for Selected Chronic Diseases, United States and Wisconsin, 1979-1997



Rates per 100,000 population; Age-adjusted to the 1970 US Population; Based on data from NCHS accessed through CDC WONDER using the following ICD-9 codes: All Cancer (140-208), Breast Cancer (174), Cervical Cancer (180), and Prostate Cancer (185)

Table 1. Summary of Selected Wisconsin Medical Journal Publications Related to Chronic Disease, 1993-200

Author	Title	Year	Conclusions
CANCER			
Russell Langlois Johnson, et al.	Increasing Gap in Breast Cancer Mortality Between Black and White Women	12/99	• Mortality rates increased 10% among blacks and decreased 7% among whites from 1979-1996 • Greatest gap in women under age 55 • Differences may be due to differences in incidence and survival
Cherney Remington	Breast Cancer Mortality Continues to Decline in Wisconsin	07/99	• Rates peaked in 1990; since 1990, age-adjusted rates have declined 3.4% per year • Decrease seen in all age groups, with largest in 45-64 age group • Trends attributed to increased mammography (up 32% from 1987-1992), better treatment, and public awareness
Remington Park	Breast Cancer Incidence and Mortality in Milwaukee's North Shore Communities	03/97	• Incidence of breast cancer is higher in these zip codes; 9-10 more cases/year than expected; also higher mortality rate with 3-4 more deaths/year • Breast cancer diagnosed at an earlier stage in these communities than in the state as a whole
Palmersheim Remington	Trends in Breast Cancer Mortality for Blacks and Whites in Wisconsin and the US, 1979-1992	04/96	• Mortality rates increased 2.1% for white women and 13.6% for black women in Wisconsin from 1979-1981 to 1990-1992
Knight	Trends in Cervical Cancer Mortality, Wisconsin and US, 1982-1994	04/97	• Mortality rates declining for black and white women, although blacks still have higher rates • Mortality declining in older populations, but increasing slightly in younger (25-44) possibly due to increased incidence, increased HPV and HIV
Bastin	Cancer Trends in Wisconsin: 1988-1996	07/99	• Approximately 25,000 cancer cases will be diagnosed each year • Lung cancer responsible for 1/4 of all Wisconsin cancer mortality, although incidence is half that of breast and prostate cancer • Age is major risk factor: 64% (M) and 54% (F) of diagnosed cases are in 65+ age group • Average years of potential life lost greatest in cervical cancer • Wisconsin cancer mortality is decreasing, while cancer incidence is increasing
Kujak Remington	Trends in Lung Cancer Mortality among Men and Women, Wisconsin and US, 1979-1994	11/97	• Lung cancer mortality increased 10% among men and 94% among women in Wisconsin in 1979-1981 vs. 1992-1994 • Particularly large increases among women 55 and older • Mirrors trends in US • Result of peak in smoking rates in 1960s
Haselow Remington	Prostate Cancer Mortality Increases in Wisconsin, 1979-1994	05/97	• Most frequently diagnosed cancer among men in WI and US, second only to lung cancer in mortality • Mortality increased 26% from 1979-1994 • Increase limited to 55 and older with highest increase in 85+ • Mortality among blacks 2x greater than whites; appears to be increasing • Factors include increased incidence, treatment, and awareness, changing reporting on death certificate
Wich Remington	Stomach Cancer Mortality Continues to Decline, Wisconsin and the US, 1982-1994	04/97	• Mortality decreased 24% from 1982-1984 to 1992-1994 • Consistent decline in all age categories; increase seen among blacks (based on small numbers) • Males 2x rate of females, blacks 2x the rate of whites • Decline is largest seen in any cancer
DIABETES			
Quenan Remington	Diabetes Mortality in Wisconsin: 1979-1997, The Increasing Gap Between Whites and Blacks	07/00	• Blacks 2x greater mortality than whites; rates highest in 45-74 age groups and among black females • Gap between white and black mortality rates have increased from 1979-1981 to 1995-1997 from a RR of 1.7 to 2.6 • Mirrors national trends; partly attributed to higher incidence among blacks
Russell Remington Brazy D'Alessio	Increasing Incidence of ESRD in Wisconsin - an Unintended Consequence of Increased Survival?	O1/00	• Incidence increased 3-fold from 1982-1997 • 1189 newly-treated cases in 1997 • Greatest increase in 65+ and among blacks and Native Americans • Greatest increase associated with primary diagnosis of diabetes and hypertension
Miller	The Burden of Diabetes: 1999**	1999	• Prevalence estimates: 330,000 Wisconsin residents have diabetes (6.3%) • Accounted for 3640 deaths in 1996 and 68,000 hospitalizations in 1997 • Cost estimates: $2.1 billion in direct and indirect costs for state of Wisconsin
Miller Remington	The Burden of Diabetes in Wisconsin: Diabetes-Related Amputations, 1994	09/96	• 1803 amputations in 1994 • Risk increases with age, highest rates among 65+ • Rate twice as great among men than women • Blacks have 3.1x, and Native Americans 4.4x rate of whites
Remington Chudy	Self-reported Cardiovascular Risk Factors Among Diabetics vs. Non-Diabetics in Wisconsin	04/94	• Population with diabetes more likely to be hypertensive, physically inactive, and overweight than non-diabetes population; also 40% more likely to smoke

Table 1 continued

CARDIOVASCULAR DISEASE			
Sibilski Wucherer	Behavior Risk Factors of Cardiovascular Disease: A Study of the Citizens of Franklin, WI	12/95	• 28% of surveyed adults reported some form of cardiovascular disease, with hypertension reported by 22% • Levels for risk factors (BP check, cholesterol check, activity, obesity) similar to overall Wisconsin BRFS results
Peterson Remington Peterson Nashold	Trends in Stroke Mortality in Wisconsin: Progress Toward Achieving the Year 2000 Objective	06/93	• Mortality from stroke declined 66% in past 3 decades • 10% decline from 1985-1990 • If 10% decline continues, will not meet 2000 objective of 32/100,000
CHRONIC DISEASE			
UW Public Health Initiative	Gender Disparities in Mortality, Wisconsin, 1980-1995	12/99	• 10% decline in all-cause death rates from 1980-1995 • Overall, female mortality rate is less than male, although rates are declining twice as fast in males • Age 45-64: saw increase in female mortality due to lung cancer • Age 65-75+: fewer deaths than expected from heart disease and stroke, but increased cancer deaths; saw decline in cardiovascular disease among men, increase in lung cancer among women
Reeves Remington Nashold Pete	Chronic Disease Mortality Among Wisconsin Native American Indians, 1984-1993	02/97	• American Indians have higher mortality rates from diabetes in all age/sex groups; ischemic heart disease mortality was greater in native men/women 45-64 • Overall, chronic diseases are responsible for excess number of deaths in middle age native population, whereas mortality experience of American Indian men/women 65+ is similar to white population

*Article submitted for publication in 01/00 to the American Journal of Kidney Diseases
** Publication of the Wisconsin Diabetes Control Program, Bureau of Chronic Disease Prevention and Health Promotion, Division of Public Health

DHFS effort to control the burden of chronic disease involves our state's women. Women have traditionally been under-represented in research studies even though they have many unique epidemiological patterns and clinical symptoms for most chronic diseases. For instance, women are more likely to experience acute myocardial infarctions with atypical symptoms. Also, women experience severe depression at rates approximately twice that of men.[17] The DHFS established the Wisconsin Well Woman Program (WWWP) in 1999 as a result of merging the federally-funded Wisconsin Women's Cancer Control Program (WWCCP) and the state-funded Wisconsin Well Woman Health Screening Program (WWHSP). The WWWP provides screening, education and referral services to low-income women for cardiovascular disease, depression, domestic abuse, osteoporosis, and breast and cervical cancers. To date, the WWWP has enrolled and screened over 20,000 women and made a number of referrals for potentially fatal conditions. Finally, the Wisconsin Women's Health Hotline went into service May 1, 2000. The statewide, toll-free hotline will provide information on the WWWP and professional advice on many health issues.[17]

III. Minority Health Program

Within the last year, DHFS hired a Minority Health Officer and has begun an in-depth look into the major disparities in health outcomes among racial and ethnic groups for almost all chronic diseases. Health disparities have received increasing public health and research attention in the last decade, and many articles give compelling evidence of the disproportionate burden of chronic diseases and conditions, particularly in racial and ethnic subpopulations.[14,18] The mortality rates for minority populations often exceed white rates, locally and nationally, in cardiovascular diseases and stroke, diabetes, cancer, chronic lung diseases and other conditions.[1,2,5] The factors that contribute to persistent health disparities are believed to be the result of a complex interplay of racial, cultural, behavioral, social, economic and institutional factors.[19]

The Minority Health Officer (MHO) is leading a statewide effort to produce an updated review of the state of minority health in Wisconsin. A two-day hearing and workshop in Milwaukee last fall produced momentum for this project, where poignant testimony was heard on disparities in cancer, cardiovascular disease and diabetes. An important focus of the upcoming report will be increased epidemiological assessment of minority populations and subpopulations. There are significant gaps in the collection of standardized data for minority populations statewide, and current statistical sampling lacks enough power to draw statistically valid conclusions about racial/ethnic groups other than black versus white.[20] To help improve the data and surveillance of chronic diseases and related risk factors, DHFS will be adding a research scientist to direct a comprehensive epidemiological program. The program will include collaboration with community-based and tribal organizations to conduct community assessments that illuminate the complex behavioral, cultural and societal forces

that contribute to chronic disease outcomes and general health status.

Turning Point

During the last two years DHFS has been collaborating with hundreds of individuals and organizations to produce Turning Point, a better understanding of the state's future direction in public health. An important part of this endeavor is to establish a set of approximately 12 priority risk factors that will spur DHFS and legislative policy and effective partnering with many collaborators on the local and community levels. This effort is near completion and will undoubtedly focus attention on decreasing smoking, improving diets, enhancing physical activity, decreasing obesity and identifying ethnic differences in the production of many chronic diseases. As such, we believe that these risk factors will continue to draw attention to the need for prioritizing public health efforts against many chronic diseases.

Summary

The last decade has seen significant progress in reduction of mortality rates from many chronic diseases on both a state and national level. Moreover, in general, Wisconsin has achieved levels below the United States for mortality. However, as suggested by Figures 1 and 2, preventive efforts in stroke and prostate cancer should become high priorities in this state. Additionally, it will be important to monitor the stabilization of death rates due to diabetes. Turning Point, anti-tobacco efforts by the Tobacco Control Board and the Thomas T. Melvin Program, and the upcoming Minority Health Report should reveal additional areas for DHFS and its statewide partners to address in the arena of chronic disease. Programs such as the Wisconsin Diabetes Control Program and the Wisconsin Well Woman Program will also continue to contribute significantly to other community and clinical efforts to control chronic diseases.

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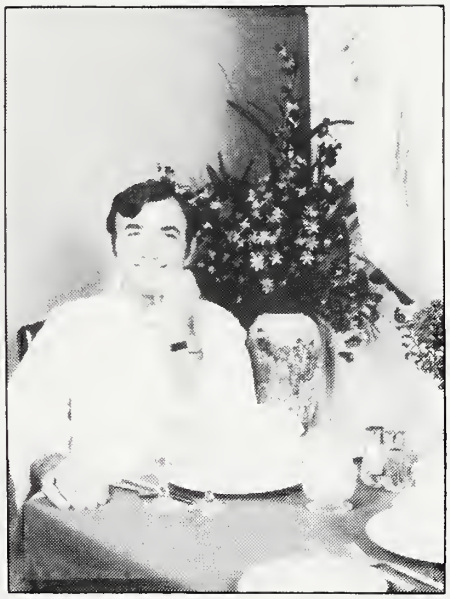

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Guest Editorial

Clinical Studies in Wisconsin: Cancer Research at the Local Level

by Peter Beatty, MD, FACP; Peter D. Rumm, MD, MPH, FAAP; and Nancy A. Freeman, BA, CHES

Why the Need for Trials?

The national trial mechanism for cancer research has been a cooperative effort of patients, local physicians, and federal agencies designed to ask and answer fundamental questions concerning cancer etiology and treatment. These scientific trials have been available to Wisconsin citizens for over 40 years. They take place in a variety of locations and facilities around the state. Answers produced from these trials have profoundly altered and advanced our knowledge of cancer and cancer treatment over four decades. Thousands of Wisconsin residents have benefited from these efforts to achieve cures for otherwise lethal disease, grant a significant prolongation of life or improve the quality of life for a cancer victim's terminal illness. Without the vigorous participation of patient volunteers and willing local physicians and nurses, these trials would never have been completed.

Doctor Beatty is a medical oncologist and hematologist practicing in Madison. He serves as principal investigator for the Meriter Hospital Community Affiliate of ECOG and is a clinical assistant professor at UW-Madison School of Medicine. Doctor Rumm is a specialist in both pediatrics and preventive medicine. He is Chief Medical Officer for Chronic Disease and Health Promotion, Division of Public Health, Department of Health and Family Services, State of Wisconsin. Ms. Freeman is Executive Director, Wisconsin Cancer Council.

Promising clinical trial areas include agents that could shut off the blood supply to growing tumors, antibodies to melanomas and other tumors; sophisticated combinations of chemotherapy and radiation therapy. We hope one day the clinical outcomes for most adult cancers will approach the great advances in childhood cancers, as about 60% of all children survive their primary malignancy for 5 years.[1]

Unfortunately, however, many adult patients are not enrolled in clinical cancer trials in either Wisconsin or nationally. Although reliable data on accrual to these trials are not widely available, it appears that between 7% to 15 % of cancer patients are ultimately enrolled in National Cancer Institute-sponsored trials.[2,3,4] As oncologists and public health physicians, we strongly feel that this hurts not only the chance for great advances in individual cures, but puts a barrier on the advancement of the health of our state's and nation's population as a whole. Reasons for this lack of enrollment to clinical trials may include a lack of insurance reimbursement and approval, unwarranted fears that a patient will not get state-of-the-art care, and a reluctance on the part of referring physicians. Oncologists are working in the state with insurers and institutions to try to overcome many of these perceived and real barriers. As such, we would like to explain more about trials in Wisconsin.

Table 1. Cooperative Clinical Cancer Trial Groups In Wisconsin

Eastern Cooperative Oncology Group (ECOG)
National Surgical and Adjuvant Breast Project (NSABP)
Cancer and Leukemia Group B (CALGB)
North Central Cancer Treatment Group (NCCTG)
Children's Cancer Study Group (CCSG)
Brain Tumor Study Group (BTSG)
Radiation Therapy Oncology Group (RTOG)
Gynecological Oncology Group (GOG)
Wisconsin Oncology Network (WON)

Table 2: Institutional Contacts for Clinical Cancer Trials in Wisconsin

Medical College of Wisconsin 414-805-4600 www.froedtert.com/healthcare/research/
University of Wisconsin Comprehensive Cancer Center 800-622-8922 www.cancer.wisc.edu/research
Marshfield Clinic 715-389-4457 or 800-782-8581 ext.94457 www.marshfieldclinic.org/Cancer/research

Where and How to Find Out About Enrolling Your Patient in a Trial

Clinical cancer trials in Wisconsin began with the Central Oncology Group, which was located in Madison and began in the 1950s. Initial studies were focused heavily on colon cancer and breast cancer.

By the mid 1970s more clinical trial groups were being established, and now at least nine separate cooperative groups are active in the state (Table 1) studying every type of malignancy in all age groups, races and locations.

The clinical trials mechanism works through "main institutions" that are expected to be major accruers in both treatment and prevention trials. Main institutions have affiliates in smaller institutions, which are usually more community-based. Funds flow to the main institutions from the National Cancer Institute and then to the affiliates on the basis of accrual numbers. Funding is targeted to support the clinical trial effort with data management, computer support, and travel to scientific meetings for investigators. An example of a "main institution" would be the University of Wisconsin Cancer Center in Madison with affiliates such as Gundersen Lutheran in La Crosse, St.Vincent's Hospital in Green Bay, Dean Medical Center in Madison and Wausau Hospital Center in Wausau.

Another mechanism for clinical trials is the Clinical Community Oncology Program (CCOP), which is an independent community entity with funding from the National Cancer Institute to run clinical treatment and prevention trials. The best example of this in Wisconsin is the Marshfield Clinic in Marshfield, which has a large enough program and outreach effort to be its own institution under a CCOP designation. Phone numbers and e-mail contacts for the major institutions in Wisconsin responsible for clinical cancer trials are listed in Table 2.

Types of Trials Available

Clinical treatment trials are generally divided into four separate types.

Phase I trials are designed to assess questions of dose and side effects in human subjects with relatively untested compounds that have exciting pre-clinical results from laboratory and animal experiments. These studies are usually done in main institutions with more sophisticated pharmacy and laboratory facilities.

Phase II trials are designed to assess efficacy of compounds brought up through Phase I testing in specific disease states. Their end points are usually response rates and further side-effect assessments.

Phase III trials take compounds and protocols developed in Phase II testing and compares them in randomized, controlled settings to "standard care." These studies tend to have multiple treatment arms to which patients are randomly assigned by computers after fulfilling eligibility criteria. End points for Phase III studies are typically overall survival, disease-free survival and quality of life in the various arms.

Lastly, Phase IV studies are large open studies conducted by pharmaceutical companies on compounds which are destined to be approved by the Food and Drug Administration to gather final toxicity data prior to official release.

In the last 25 years, clinical trials have become more demanding and technical in terms of entry criteria, data monitoring, and follow-up. The majority of clinical cancer trials in Wisconsin are now sponsored and funded by the National Cancer Institute in Bethesda, Maryland. Citizens from every corner of the state are within a 2-hour drive from a center conducting some form of cancer clinical trial.

Summary

These trials bring the latest scientific information and treatment ideas to Wisconsin residents. These studies benefit all of us and advance our knowledge in an ethical and organized fashion. They will permit us to bring the new advances of molecular biology and "translational research" to the clinic in the fastest possible manner. They deserve our continued strong support, both on an individual basis and in the interest of improved public health.

For More Information

The Cancer Information Service (CIS), a program of the National Cancer Institute (NCI), is a reliable source for the latest and most accurate information on cancer, including information on clinical trials for health professionals, their patients and families. Specially trained staff are available to provide personalized answers to questions about prevention, screening, early detection, diagnosis, treatment and research. These information specialists can provide up-to-date information about clinical trials through access to the PDQ®, the NCI's comprehensive cancer trials database.

Contact 1-800-4-CANCER between 9 a.m. and 4:30 p.m., Monday-Friday. Or visit the Cancer Trials website (http://cancertrials.nci.nih.gov/), a comprehensive resource center for clinical trials maintained by NCI.

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Chronic Disease in the Minority Population

Setting goals to eliminate racial health care disparities

By Marc Kennedy
special to *WMJ*

Back in February 1998, President Clinton unveiled his initiative on race and health. In it, he announced the goal of eliminating racial disparities in health by 2010, coinciding with the "Healthy People" initiative, which sets the nation's health agenda every 10 years. For all the medical breakthroughs we have seen in the past century, we still see significant disparities in the medical conditions between racial groups in this country.

Through this initiative we have, for the first time in the history of our government, made a real commitment to eliminate — not just reduce — some of the health disparities between majority and minority populations. We have selected six areas to bring our efforts into focus: infant mortality, child and adult immunizations, HIV/AIDS, cardiovascular disease, cancer screening and management, and diabetes.

However, eliminating disparities is not a zero-sum game. We are not taking anything from anyone when we pledge to focus on the health needs of those most at risk. We are operating on the premise upon which the Public Health Service was founded 200 years ago: "The entire nation benefits when we protect the health of those most vulnerable."

–From the website of David Satcher, MD, US Surgeon General

As an epidemiologist who has studied health statistics in Wisconsin for 15 years, one aspect that has stood out for SMS member Patrick Remington, MD, is the disparity in chronic disease outcomes between the majority population and the population of racial and ethnic minorities. "When we examine statistics in health, we stratify outcomes by race, whether or not someone was hospitalized or had smoking-related illness, developed diabetes, cancer, etc.," said Remington, associate professor of Preventive Medicine at the University of Wisconsin Medical School, and director of a newly-established population health program. "Whenever we have looked at measures of population health, it is worse among minorities. The most striking thing I've found is how these disparities have widened. This is cause for concern — not only long-standing disparities, but gaps are growing across the board."

He cited as just one example a paper in the December 1999 *WMJ* that reported a growing gap in breast cancer between the white population and the minority population.

"Also, the gap has been increasing for mortality rates in every age group between minorities and whites in the last 10 to 15 years. That really is the hardest measure of population health," Remington added. "Since 1980, the mortality rate for all age groups of minorities is up 30 to 60 percent. In health, the gap between white and minority populations is growing."

> "We can't deny that there are differences in access to state-of-the-art care, but we don't know why. We don't know what the exact provider effects and cultural effects are. But whatever the exact reasons, the bottom line is that when we see these gaps, it demands action."
>
> **Patrick Remington, MD, MPH**

From Surgeon General Satcher to the local county health officer, this is an alarming dichotomy.

"On one hand, we have the good news that the mortality rates for the entire population have improved," Remington said. "Then, on the other hand, we have the bad news that for black children, the mortality rate is way up."

And although Wisconsin fares better than most states, disparities in health outcomes do exist.

"In Wisconsin, minorities' health outcomes seem to be better than the national levels in every category except stroke, but we still have disparities," said SMS member Peter Rumm, MD, MPH, Chief Medical Officer of the Chronic Disease Prevention and Health Promotion at the Division of Public Health. Reams of statistics exist that indicate a growing gap in health outcomes. The Surgeon General's office has addressed this issue by making it a national priority embodied in the Healthy People 2010 program, and the Wisconsin Division of Public Health (DPH) has embarked upon a similar strategic plan, known as Turning Point, which aims to diminish health care disparities.

To help meet that goal, DPH has hired a minority health officer and a research scientist to conduct a comprehensive epidemiological program that will, in the Division's words, "include collaboration with community-based and tribal organizations to conduct community assessments that illuminate the complex behavioral, cultural and societal forces that contribute to chronic-disease outcome and general health status."

The first step, according to DPH officials, is to collect accurate data to establish a benchmark with which to base success in addressing these disparities. And that will take some time.

"We are now trying to obtain updated data for the state's minority population," said Minority Health Officer Denise Carty, RN, MPH. "We won't have this until the census data are in. We have to have accurate data to enable us to have an accurate barometer on minority health. Once we get consistent data on chronic illness and death

for all populations statewide, we will have a baseline.

"Our task is to get accurate numbers, establish benchmarks and then goals for addressing these issues. If we can, we'd like to get data down to the county level," she said. "We are working with local and regional health departments, community organizations, HMOs, hospital associations, tribal leaders and anyone else who can help us in this effort. We want to share information with these organizations and encourage their suggestions. We need to work together, to coordinate, to collect data consistently. This will take a lot of strategic planning."

Collecting data to establish this benchmark for health outcomes is just a first step though. DPH and others involved in addressing minority health concerns are also focusing on the other variables in this equation: why the disparities exist and what can be done about them?

Why the Disparity?

If the overall health of the general population has improved markedly in the past 20 years, why has the health of minorities consistently lagged behind, and why is it apparently getting worse? "This is a hard question to answer," said Remington, "but if you really break it down into the broad components, there seem to be two common themes: lifestyle and access to health care.

"For lifestyle, there are indications that a better life style will improve health — regular exercise, not smoking, eating a healthy diet, etc. However, this seems to be tied into educational level. The greater the education, the higher the socioeconomic level, the more likely someone is not to smoke or to quit, to exercise and to eat a healthier diet. This explains some of the disparity," he said.

But Remington added that this also raises several other questions, such as, "Is this disparity due to being a minority or being poor?"

"I think we can say that much of the disparity in health is due to income, but not all," he said. "To an extent, poverty is equivalent to poor health. In health statistics, I think economic and socioeconomic factors

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offer pretty good evidence that lifestyle improves as you move up the socioeconomic ladder. This is all tied into the other reason for the widening disparities in health between the majority and minority populations, which is access to health care.

"A lot of studies show discrepancies regarding who receives bypass surgery, immediate stroke treatment, cancer therapy: The poor minorities get less care, even when you are not talking about insurance availability."

Critics of today's health care system are quick to point to outright racism as a key explanation for the lack of access to contemporary health care.

"We can't deny that there are differences in access to state-of-the-art care," Remington said, "but we don't know why. We don't know what the exact provider effects and cultural effects are. But whatever the exact reasons, the bottom line is that when we see these gaps, it demands action."

As part of the Healthy People 2010 project, the federal government will provide block grants to states, part of which will be earmarked for addressing these disparities. Still Remington stresses that achievable goals are vital or the entire plan is likely to fail.

"In a paper we wrote, we showed the black and white age-of-death disparity for Wisconsin," he said. "We have to be careful when we set life-expectancy goals because there is no way that we will be able to eliminate this gap by 2010 based on national and international historical precedents. What is realistic then? We have to set this and strive to meet it."

At the same time, some question the wisdom of the national push to close the gap in disparities, which they claim will cause an overall drop in health-care advances for the general population.

"Can you focus on minority health and reduce the gap without diminishing overall health gains in the general populace? It's an intriguing philosophical debate," Remington said. "Some medical economists will counter the argument that prevention saves money overall. Only for prenatal care can we

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prove on an entirely monetary level that it saves medical costs. It does not appear to for cancer and diabetes care, nor even for smoking cessation. For every $1000 we spend on smoking cessation, it adds one year of life. So, while economics is part of the whole picture, it is not the only component."

To Remington, addressing the discrepancy is the right thing to do regardless of economic prudence. Since the discrepancy issue is a public health concern, taking a public health approach is the right place to start. And Wisconsin's Division of Public Health is facing that challenge. "The first thing we have to do is measure and set objectives," said Remington. "This is what the Department of Public Health is doing now — measuring things like mortality, morbidity, health care utilization, quality of life, etc. Once we have measured this, then we set objectives to reduce the disparity. We put resources into the state to meet these objectives. It is very important for the SMS to be prominent in this effort to improve quality of care and to improve public health."

Gathering Consistent Data Essential

Consistent and reliable data is so important because policy makers will eventually determine how to expend resources to address the disparity in health outcomes. So as they establish and expand relationships with health-care providers throughout the state, Rumm, Carty and others at DPH who are trying to address health-outcomes disparity will stress this need for accurate and comparable information.

"We are anxious to see that data be collected," Rumm said, "but it needs to be gathered consistently. Providers are already gathering the information — birth, hospitalization, death, etc. — but we just can't assume that everyone is applying the same standards when considering ethnicity and minority healthcare data. We are working with health care providers and health officials to make sure fields are filled out reliably.

"For example, we have an innovative diabetes program in this state. We worked with the SMS on confidentiality

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issues to ensure we could capture technical information in a blinded fashion," he said. If coding is inconsistent, it can affect the accuracy of outcomes in the long run, added Carty.

Thus, "improving data collection is a priority. It is critical in epidemiology. In the Minority Health Program, we are helping to pull together all the cooperative people to develop strategies, standardize types of coding and integrate data efficiently, without it becoming a burden for the providers," she said. "They already have to collect data, so they might as well be consistent."

Once systems are in place to capture consistent data, DPH plans to report data more regularly.

"We are not able to do that now, but we are working on it," Carty said. "Also, we plan on updating the minority health report on mortality and morbidity. The last one was published in 1993. Our goal is to update this throughout this year. We have met with key people among minority populations in Wausau and Milwaukee. Hopefully, if we get coordinated systems in place, it will be easier to update every two or three years." DPH also plans to take advantage of advances in technology.

"We plan on putting information out on the Web to make it easier to access," Rumm said. "We are working on this now. We feel it is imperative to make the information accessible to the public, as well as health care professionals, especially concerning the status of health care in their own communities."

Rumm and Carty emphasized that cooperation among state and local health-care agencies and health-care providers, large and small, is crucial. Only through this type of cooperation can they properly collect reliable data that will eventually determine where and how resources will be focused to help bridge the gap in health outcomes.

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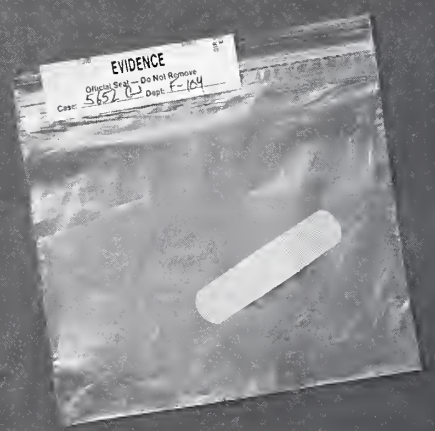

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Colorectal Cancer in Wisconsin: Trends in Mortality, Prevention, and Early Detection Strategies

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THE BURDEN OF COLORECTAL CANCER

In the United States and Wisconsin, colorectal cancer is the second leading cause of cancer mortality, exceeded only by lung cancer, and is responsible for approximately 56,000 deaths in the United States and 1000 deaths in Wisconsin every year.[1] By gender, colorectal cancer is the third leading cause of cancer mortality, surpassed only by lung and prostate cancer in men and by lung and breast cancer in women. However, with early detection, colorectal cancer is highly treatable and curable.

Colorectal cancer remains an important public health problem that historically has received inadequate attention on both the national and state level. During the past year media attention has dramatically increased, including a number of high-profile screening campaigns. The National Colorectal Cancer Research Alliance (NCCRA) was established in 1999 by Katie Couric, Lilly Tartikoff, and the Entertainment Industry Foundation to end the threat of colon cancer through education, new research, and regular medical screenings. Couric has waged a personal battle against the disease since losing her husband to colon cancer in 1998. Other celebrities like New York Yankees outfielder Darryl Strawberry and St. Louis Cardinals outfielder Eric Davis have talked openly about their struggles with the disease.[2] In 1999, the National Colorectal Cancer Roundtable sponsored public service announcements, featuring First Lady Hillary Clinton, detailing the importance of screening to prevent and detect colorectal cancer. Most notably, the US Congress designated March 2000 as Colorectal Cancer Awareness Month.[2] The recent media attention focusing on colorectal cancer brings the prospect of improved public awareness and highlights the pressing need for clear and consistent screening recommendations.

Doctor Rumm is Chief Medical Officer and State Epidemiologist, Bureau of Chronic Disease Prevention and Health Promotion, Division of Public Health, Wisconsin Department of Health and Family Services (DHFS). Ms. Foote is Wisconsin Cancer Reporting System Epidemiologist, Wisconsin Bureau of Health Information, funded in part by the Centers for Disease Control and Prevention's National Program of Cancer Registries Enhancement grant. Ms. Quenan is a Public Health Intern, Bureau of Chronic Disease Prevention and Health Promotion, Division of Public Health, DHFS; supported through funding from the Department of Preventive Medicine, University of Wisconsin.

DATA SOURCES

Wisconsin data on colorectal cancer were abstracted from *Wisconsin Colorectal Cancer,* a publication of the Wisconsin Cancer Reporting System (WCRS), Bureau of Health Information, and compared to national data from *SEER Cancer Statistics Review 1973-1996*, a publication of the National Cancer Institute.[3,4] All rates are presented per 100,000 population and age-adjusted using the 1970 United States population as a standard. Percent change was calculated as the difference between the rates in 1990 versus 1996, divided by the rate in 1990. Screening data were selected from the 1997 results of the Behavioral Risk Factor Surveillance System (BRFSS) maintained by the Centers for Disease Control and Prevention (CDC). National screening data are medians for all BRFSS state participants, including Puerto Rico and the District of Columbia.

EPIDEMIOLOGY OF COLORECTAL CANCER

Wisconsin age-adjusted mortality rates from colorectal cancer have steadily declined from 1980-1996, with a 20% decrease seen from 1990-1996 (Table 1). This decrease is slightly larger than 11% decline noted in the United States for the same time period. By 1996, Wisconsin had already met and exceeded the national objective for the reduction of colorectal cancer mortality (Figure 1). The objective, set by national public health leaders and outlined in Healthy People 2000, called for a 7% reduction in colorectal cancer mortality to 18.7 per 100,000.[5]

The mortality rate from colorectal cancer for Wisconsin men in 1996 was 20 per 100,000 and for women, a lesser 13 per 100,000 (Table 2). Similar differences in mortality between men and women are seen in the United States. Discrepancies are also noted in colorectal cancer mortality by race (Table 2). Mortality from colorectal cancer among the African American population, in both the United States and Wisconsin, was 1.5 times greater than mortality for whites in 1996. Rates for African Americans in Wisconsin are slightly higher than national rates (26 vs. 23 per 100,000). It should be noted that the relatively small minority populations in

Wisconsin may result in less reliable race-specific rates. Table 1 also indicates a significant 10% reduction in colorectal cancer incidence in Wisconsin from 1990 to 1996 (52 to 47 per 100,000). This reduction is similar to trends noted for the United States in the same time period. However, rates of incidence in Wisconsin still remain above those of the United States.

Based on results from the 1997 BRFSS, an estimated 50% of Wisconsin adults aged 50 and older reported ever having had a sigmoidoscopy/proctoscopy for screening or diagnostic purposes, compared to an estimated 42% of adults in the nation (Table 3). An estimated 43% of Wisconsin adults reported ever having had a fecal occult blood test (FOBT), a percentage slightly above the national median. State and national trends indicate men report higher levels of screening than women, with 39% of men and 31% of women over age 50 in Wisconsin indicating they had received a sigmoidoscopy in the past 5 years.[3]

DISCUSSION

Incidence and mortality data indicate that Wisconsin is succeeding in reducing the burden of colorectal cancer. Furthermore, Wisconsin has met and exceeded the national 2000 objective for colorectal cancer mortality. A number of factors have contributed to this success. Wisconsin is among the leading states in providing access to health care, and currently ranks second in the nation in health insurance coverage, maintaining a low 9.4% uninsured rate from 1996-1998.[6] Excellent medical schools and many superb community hospitals staffed with oncologists and surgeons provide access to aggressive and state-of-the-art detection and treatment. Furthermore, Wisconsin ranks above the national median in the proportion of residents reporting consumption of five or more fruits and vegetables daily and the proportion reporting physical activity during the past month.[7] Finally, levels of screening in Wisconsin are comparable and perhaps slightly better than national levels.[3,8] Levels of screening in Wisconsin may result in increased detection and reporting of cases, most likely resulting in the higher incidence rates in Wisconsin versus the United States.

However, it should be noted that further progress is needed. Race and gender discrepancies in colorectal cancer mortality are present for both Wisconsin and the United States in the past decade, with a significant burden being placed on the male and African-American populations. Increased incidence, access to care, genetic differences, and other as yet unidentified factors may be contributing to these disparities. Further resources and data analyses need to be devoted to describing and reducing these disparities.

SCREENING FOR COLORECTAL CANCER

Although Wisconsin is maintaining a level of screening comparable to national levels, there remains room for improvement. Limitations in accuracy, cost-effectiveness, and patient acceptance may still discourage screening for this disease. FOBT is inexpensive but may hold an aversion for many people. In addition, both the positive predictive value and the sensitivity of this test are not high (therefore, one can expect many undiagnosed colorectal cancers and false positives). Most data suggest the sensitivity in detecting colorectal cancer is only about 40%.[9] In addition, there is the unimpressive ratio of 20 patients undergoing additional diagnostic testing with negative results, relative to the 1 case of colon cancer verified. As such, it was not until 1993 that studies first indicated colon cancer was reduced by one-third among populations over age 40 screened with FOBT.[9]

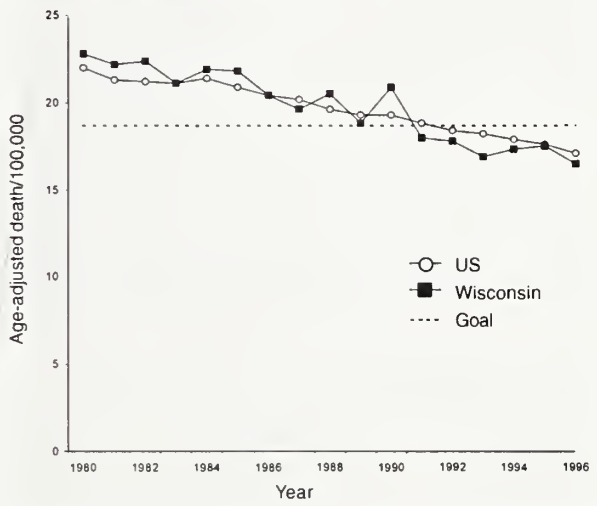
Sigmoidoscopy, the second common screening and diagnostic test, remains expensive, is considered invasive by patients, and does not reach beyond the lower

Table 1. Age-Adjusted Colorectal Cancer Incidence and Mortality Rates*, Wisconsin and the United States, 1990 and 1996

	1990	1996	% Decrease
Incidence Rate			
Wisconsin	52	47	10%
United States	48	43	10%
Mortality Rate			
Wisconsin	20	16	20%
United States	19	17	11%

*Rates presented as cases (incidence) and deaths (mortality) per 100,000 and age-adjusted to 1970 United States population

Figure 1. Age-adjusted Mortality for Colorectal Cancer, Wisconsin, the United States, and the National 2000 Objective, 1980-1996



*Rates per 100,000; age-adjusted to the 1970 US population; national objective based on information from *Healthy People 2000*.[5] Colorectal cancer defined by ICD-9 codes: 153-154, 159

Table 2. Age-Adjusted Colorectal Cancer Mortality Rates* by Gender and Race, Wisconsin and the United States, 1996

	Wisconsin	United States
Gender		
Male	20	21
Female	13	14
All	16	17
Race		
White	16	16
African American	26	23
All	16	17

*Rates presented as deaths per 100,000 population and age-adjusted to the 1970 US population
**Includes all other races

Table 3. Percent of Residents, Age 50+, Who Report Ever Having Had Colorectal Screening Tests, Wisconsin and the United States, 1997

	Fecal Occult Blood Test (%)		Sigmoidoscopy/ Proctoscopy (%)	
	Wisconsin	U.S.	Wisconsin	U.S.
Age				
50-59	35	31	42	33
60-64	40	41	47	43
65+	51	44	57	47
Total	43	40	50	42

Table 4. Colorectal Cancer Screening Recommendation from Leading Organizations

Organization	Recommendation
The American Cancer Society	For those 50 and older: • Yearly FOBT • Sigmoidoscopy every 5 years • Full colonoscopy or double contrast barium enema every 10 years
The American College of Family Physicians	For those 50 and older: • Yearly FOBT • Sigmoidoscopy, colonoscopy or barium enema every 10 years
The US Task Force on Preventive Services	Screening for population over 50: • FOBT or sigmoidoscopy • Believes there is insufficient evidence to promote combined screening at any specified frequency

colon. Specificity approaches 100% due to the capacity to biopsy tissue, and sensitivity approaches 60% with a 60-cm sigmoidoscopy.[9] Yet, it was not until 1992 that studies provided conclusive evidence of the efficacy of this test for the asymptomatic general population age 50 and over, suggesting screening periods as long as 10 years may be efficacious.[9] Finally, as late as 1996, there still was not a consensus on the benefit of a combined screening approach, that of FOBT and periodic sigmoidoscopy, in producing a significant decline in colorectal mortality.[10,11]

There remains some controversy over the periodicity of screening for colorectal cancer by FOBT and sigmoidoscopy in the general population. Recent extensive reviews on this subject from many organizations are available in the most recent *Putting Prevention into Practice – Clinician's Handbook of Preventive Services*, and *Wisconsin Colorectal Cancer* by the Bureau of Health Information.[3,9] All major organizations recommend increased screening frequencies with both FOBT and sigmoidoscopy (and in some cases full colonoscopy) in hereditary conditions, previous polyps, inflammatory bowel conditions, and first degree relative with colorectal cancer. For the general population, recommendations from three organizations are presented to demonstrate the variance among authoritative cancer groups (Table 4).

RISK FACTORS AND PREVENTION

For screening and early diagnosis to be effective, it is important to identify prominent risk factors and at-risk populations. Other than certain hereditary conditions, the strongest risk for colorectal cancer is increasing age – 90% of new diagnoses occur among those over age 50. Three other factors that most significantly contribute to the general population attributable risk include physical inactivity (around 32%), high fat diet (15%-25%) and low intake of vegetables (25%-35%).[9,12]

Diet presumably influences the colorectal cancer etiology, but the precise causative factors are yet unknown. The most controversial diet related issue is that of fiber. A recently completed 16-year national study of women found no protective effect of dietary fiber consumption.[13] Yet previous ecological studies comparing industrialized Western cultures with more traditional cultures consistently demonstrated a role for high fiber in colorectal prevention.[14] Despite this new controversy, the American Cancer Society and most federal health agencies still firmly recommend a high fiber diet.[9] Evidence also suggests that certain supplements, such as folic acid, selenium and calcium, may provide a protective effect against colon cancer.[15,16]

Estrogen supplement use has consistently shown an association with a reduced risk of colorectal cancer by as much as 46%.[17,18] Studies have also suggested that long-term aspirin use may reduced the risk of colorectal cancer.[19] However, the duration of aspirin use needed to accumulate the protective effects is still debated, as a large 1998 study of healthy male physicians failed to find a protective benefit after a short 5-year consumption period.[20]

CONCLUSION

Colorectal cancer accounts for 10% of all cancer deaths, and remains the second leading cause of cancer

deaths in the United States and Wisconsin. The relatively slow development of colorectal cancer is highly subject to early intervention and prevention by the removal of pre-cancerous polyps: national survival rates for 1- and 5-year intervals are 80% and 62%, respectively. Most major cancer organizations advocate early screening, by age 50, for asymptomatic individuals at average risk, while not being in concert about recommended time intervals or test options.

Wisconsin has marginally lower mortality rates than the nation as a whole, and has reached the national Healthy People 2000 mortality objective. Wisconsin also compares favorably with the nation in long-term colorectal screening prevalence. One half of Wisconsin residents aged 50 or over have ever been screened with the sigmoidoscopy compared to 42% nationally, exceeding the Healthy People 2000 national objective for sigmoidoscopy screening (40%) in this age group.[5] However, Wisconsin data indicate considerable disparities in mortality rates by race and gender. Also, Wisconsin consistently reports a higher incidence rate overall and by both gender and race, which may be attributable to higher risk factors not manifest in the Behavior Risk Factor Surveillance System, higher screening prevalence, or other factors unexplored in this paper.

Clinicians should advise their patients to strive toward preventive and healthy practices: screening after age 50 or earlier in the presence of high risk factors, a high vegetable – low fat diet, regular physical activity, and the potential benefits of estrogen and aspirin therapy.

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Progress in Cancer Control in Wisconsin

Lynn Quenan, MS; and Patrick Remington, MD, MPH

ABSTRACT

Introduction: The burden of cancer in Wisconsin is significant, with cancer accounting for nearly 25% of all deaths in 1997. State and national trends indicate a decline in overall cancer mortality since the early 1990s. This report reviews the progress in cancer control in Wisconsin in the past decade and assesses progress toward reaching the 2000 cancer objectives outlined in the Wisconsin Public Health Agenda.

Methods: Mortality data were abstracted from CDC WONDER from 1984-1997 in a manner consistent with the data presented in the Wisconsin Public Health Agenda. Overall cancer mortality, as well as site-specific cancer mortality rates, was analyzed by calculating the percent change in the baseline period (1984-1986) versus the most recent available data (1995-1997).

Results: Overall cancer mortality rates in Wisconsin decreased 1% from 1984-1986 to 1995-1997, decreasing among those under age 65 but increasing among those 65 years of age and older. Rates declined in the white population, but increased among blacks and other races. Site-specific data indicate a 6% decrease in cervical cancer, an 18% decrease in breast cancer, and a 20% decrease in colorectal cancer occurred during this time period. Increases were seen in lung and prostate cancers, and in malignant melanoma.

Discussion: This analysis indicates progress in the reduction of overall cancer mortality among persons under age 65. Objectives for 2000 will be met in both breast and colorectal cancer, with some progress noted in reversing the steady increase in lung cancer mortality in the state.

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INTRODUCTION

The burden of cancer in Wisconsin is significant. Cancer ranked as the third leading cause of death in Wisconsin in 1997, accounting for almost 25% of the total deaths during this time period.[1] More importantly, cancer is a significant cause of premature mortality, accounting for greater than 25% of all deaths among persons less than 65 years of age.[1]

Recently, national research has indicated a decline in overall cancer mortality for the first time ever since the early 1990s.[2] An article in the *Wisconsin Medical Journal* reported similar trends in Wisconsin.[3] This report presents an overview of the current progress in cancer control in Wisconsin, utilizing the cancer objectives identified in the Wisconsin Public Health Agenda as a baseline for assessment.[4] This review is important, as planning begins for the 2010 objectives for cancer control.

METHODS

Cancer mortality data for Wisconsin from 1984-1997 were obtained from the National Center for Health Statistics using the WONDER program available online from the Centers for Disease Control and Prevention. All data are representative of cancer listed as the underlying cause of death on the death certificate. Specific cancer sites were selected based on searches for the following International Classification of Diseases (ICD-9) codes: all sites (140-239), lung (162), breast (174), cervical (180), colorectal (153-154), malignant melanoma (172), and prostate (185). All rates are presented as deaths per 100,000 individuals. Because of limitations of the data source, the analysis by race is limited to three categories: white, black, and other (which includes Asian/Pacific Islanders and Native Americans).

The analysis for this report was undertaken with the specific aim of remaining consistent with the methods used for the completion of the Healthier People in Wisconsin 2000 objectives for cancer.[4] In this report, rates are expressed from the baseline period (1984-1986), age-adjusted to the 1970 United States population, and presented as 3-year averages. The percent change between two rates was calculated as the difference in the 3-year average rate of the most recent

years (1995-1997) and the baseline period (1984-1986) divided by the baseline rate (1984-1986). Arrows on Figure 2 indicate the trend needed to meet the 2000 objective for Wisconsin.

RESULTS

Between 1984-1986 and 1990 the cancer mortality rate for all sites (ICD-9: 140-239) increased from 164.4 to 172.8 per 100,000 before declining to 162.4 in 1995-1997. Given this trend, it appears the Wisconsin 2000 objective for overall cancer mortality (149/100,000) will not be met (Figure 1). Rates for specific cancer sites are provided in Table 1. Although the overall mortality rate declined since 1990, there is substantial variation by age, race, and cancer site.

The relative stability of the overall cancer rate reflects the decrease in cancer mortality rates in those 35-64 years of age, counteracted by similar increases in the population aged 65 years and older (Table 2). Differences are also seen among the different racial groups in the state. Whites saw a slight decline in cancer mortality, while both blacks and other races saw an increase in rates from 1984-1986 to 1995-1997. Blacks have the highest rate of overall cancer mortality (237.7 per 100,000 in 1995-1997).

Lung cancer mortality rates increased by 10% from 1984-1986 to 1995-1997 (38.0 to 42.3 per 100,000) (Figure 2). This rate is slightly higher than the 2000 objective of 39 per 100,000. The increase in lung cancer mortality can be directly attributed to increased rates of lung cancer mortality among women. Although males had a higher rate of mortality from lung cancer than females (50.9 vs. 33.0 per 100,000 in 1995-1997), females experienced a 47% increase in lung cancer mortality from 1984-1986 to 1995-1997 (22.5 to 33.0 per 100,000). Males experienced a 7% decrease in deaths for the same time period (data not shown).

In contrast to the results for overall cancer and lung cancer, breast cancer mortality decreased by 18% in Wisconsin from 1984-1986 to 1995-1997 (29.9 to 24.5 per 100,000) (Figure 2). The 782 deaths attributed to breast cancer in 1997 represent the lowest number of deaths from this cancer since 1980. The Wisconsin 2000 goal for breast cancer mortality, set at 24 per 100,000, will most likely be met and surpassed if the current trends in breast cancer mortality are maintained.

Cervical cancer accounts for approximately 70 deaths per year in Wisconsin. Death rates have remained relatively stable from 1984-1986 to 1995-1997 (2.4 to 2.3 per 100,000) (Figure 2). Although the mortality rate remains low, the slight 6% decline in mortality rates from 1984-1986 to 1995-1997 does not represent the downward trend necessary for meeting the 2000 objective of 1.2 per 100,000 women.

Table 1. Age-adjusted Mortality Rates* by Cancer Site in Wisconsin: 1984-1986 vs. 1995-1997

Cancer Site	Rate 1984-1986	Rate 1995-1997	% Change	2000 Goal
All sites	164.4	162.4	-1%	125.0
Lung	38.0	41.8	10%	39.0
Breast	29.9	24.5	-18%	24.0
Cervical	2.4	2.3	-6%	1.2
Colorectal	20.7	16.6	-20%	15.0
Malignant Melanoma	1.8	2.2	20%	1.8
Prostate**	19.4	20.4	5%	---

Rates/ 100,000 population
*Age-adjusted to the 1970 US population; includes all races and both genders (breast and cervical cancer limited to female population).
** Prostate cancer was not included in the Wisconsin 2000 Objectives, therefore no 2000 goal is reported for this cancer

Table 2. Trends in All-site Cancer Mortality by Age and Race in Wisconsin: 1984-1986 vs. 1995-1997

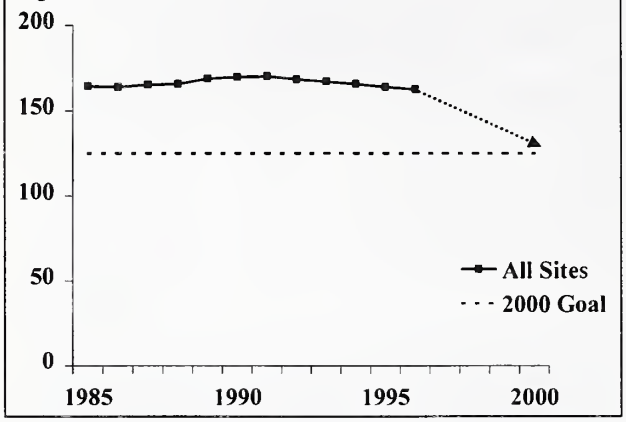
	Rate 1984-1986	Rate 1995-1997	% Change
Age			
< 35	7.0	5.6	-20%
35-44	42.0	35.2	-16%
45-54	155.9	122.7	-21%
55-64	407.9	3 80.5	-7%
65-74	822.5	846.4	3%
75-84	1267.0	1365.0	8%
85+	1709.5	1892.0	11%
All Ages*	164.4	162.4	-1%
Race*			
White	163.2	160.3	-2%
Black	230.6	237.7	3%
Other**	132.0	149.2	13%

Rates/100,000 population
*Age-adjusted to 1970 US population (all races, both genders)
**Includes all other defined races

Similar to cervical cancer, malignant melanoma accounts for relatively few cancer deaths, approximately 100 deaths per year. However, from 1984-1986 to 1995-1997 malignant melanoma saw the greatest increase in mortality of all the cancers identified in the Wisconsin 2000 Objectives (Figure 2). The 20% increase resulted from a rate increase of 1.8 to 2.2 per 100,000 in the 11-year period. It is unlikely that the 2000 objective for malignant melanoma will be met.

The greatest decrease in cancer mortality has been observed in colorectal cancer. From 1984-1986 to 1995-1997, the colorectal cancer mortality rate decreased 20% from 20.7 to 16.6 per 100,000 (Figure 2). This decrease was noted in all age groups, but particularly in those 45-74 years of age (data not shown). With this continued trend, the Wisconsin 2000 objective for colorectal cancer will be met (15 per 100,000).

Figure 1.



Although a 2000 objective for prostate cancer was not determined, surveillance of prostate cancer trends has become important in the past decade because of its increasing incidence and mortality. Prostate cancer is currently listed as the second leading cause of cancer death among men in Wisconsin.[1] From 1984-1986 to 1990, prostate cancer mortality rates increased from 19.4 to 23.7, followed by a decrease to 20.4 per 100,000 in 1995-1997 (Figure 2).

DISCUSSION

After peaking in 1990, the all-cause cancer mortality rate in Wisconsin has begun to decline. This reflects a national trend, and results from improvements in cancer prevention, early detection, and improved treatment. Although Wisconsin will not meet the 2000 objective for overall cancer mortality, it appears this objective was too optimistic, calling for a 20% decline in only 15 years.[4] The national 2000 objective, covering the same time period, called for a more realistic 5% decline in cancer mortality (175.0 to 171.0 per 100,000).[5] By this standard, Wisconsin's overall progress in cancer control exceeds national expectations.

Wisconsin has had some notable success in decreasing mortality trends in a number of cancers, including breast and colorectal cancer. Furthermore, data indicate age-adjusted invasive cancer incidence rates have remained relatively stable from 1990-1997, and an increasing percentage of all cancers are being diagnosed at the local stage. This increased diagnosis at an early stage includes increased percentages of early diagnosis for breast and prostate cancer.[1] Continuing the positive trends in cancer control will require focusing resources on a number of key areas, including risk factor reduction, screening, and race and age disparities.

The most significant risk factor for cancer control is tobacco use. Tobacco use remains the single most preventable cause of death in the United States, contributing to more than 1 out of 6 deaths.[6] Smoking has the greatest effect on lung cancer mortality, with greater than 80% of lung cancer deaths attributed to smoking. Although lung cancer deaths have begun to decline among men, the death rate among women has seen a substantial increase. This increase in women is expected to continue because of historical smoking patterns and the delayed effects of long-term tobacco use.[7]

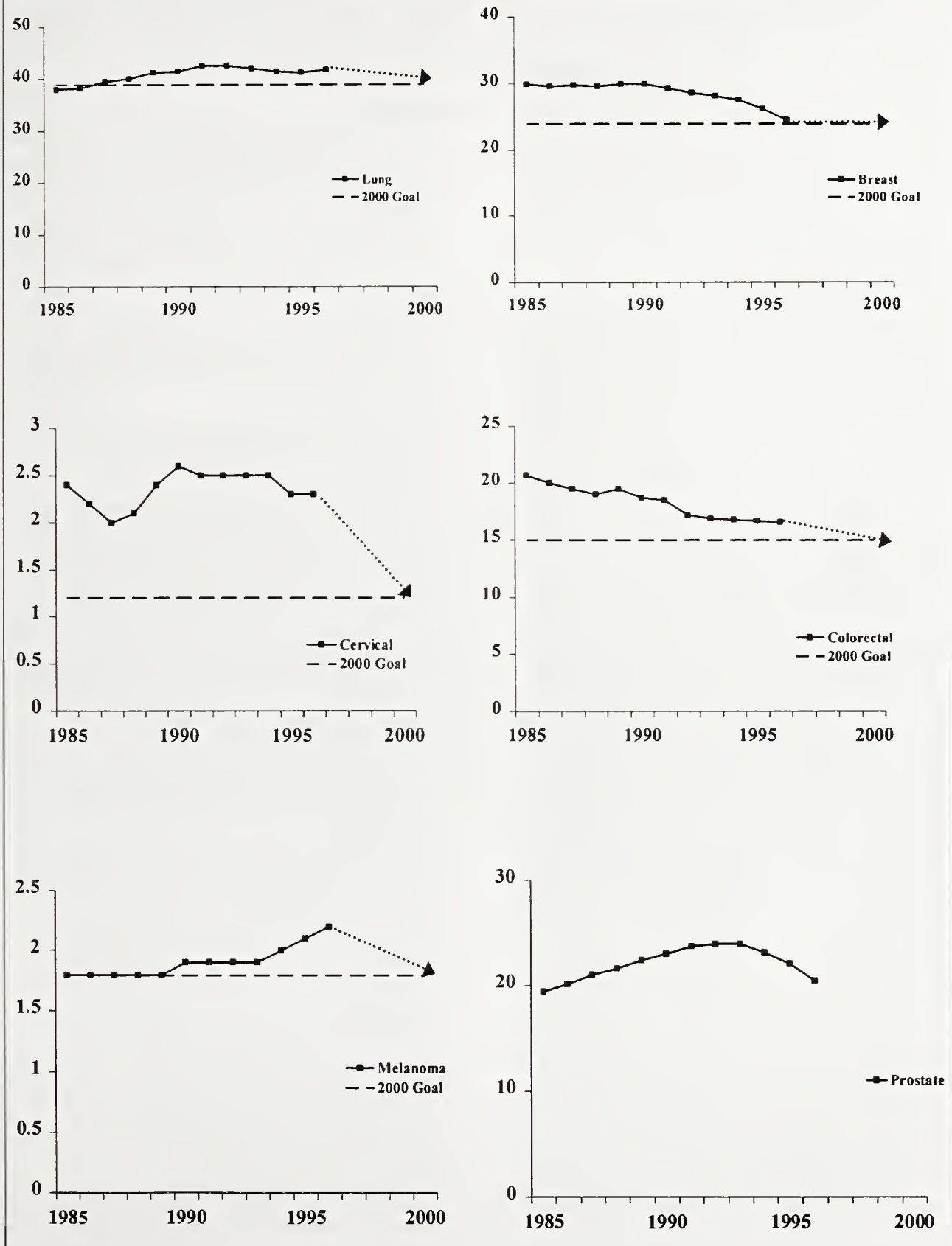
United States trends indicate the per capita use of cigarettes has decreased significantly from the 1960s through the 1990s. However, 24.7% (48 million) of adults in the United States currently smoke, a percentage that has remained unchanged in the 1990s.[8] In 1997, 23% of Wisconsin adults were current smokers, which represents a decrease from the percentage in 1984 (27%).[8,9] Yet emerging trends indicate an increase in tobacco use among youth. According to the 1999 Wisconsin Youth Risk Behavior Survey (YRBS), a survey of 9th through 12th graders in Wisconsin schools, the incidence of smoking among youth in Wisconsin has increased during 1993-1999 from 32% to 38%. Furthermore, 4 of 10 youth smokers reported smoking every day in the past month.[10] A continuation of these trends in tobacco use among youth may have dire consequences for the future of cancer control.

Also important to cancer control is the effective use of screening techniques and education for the early diagnosis and treatment of preventable cancers. Much of the decline in breast cancer mortality in Wisconsin can be attributed to early detection through the use of mammography and early breast cancer treatment. In 1997, 70% of women over age 50 in Wisconsin reported having had a mammogram in the past 2 years.[1] Decreases in colorectal cancer mortality may also be attributed to increased detection through screening. The rate of sigmoidoscopy in Wisconsin in the population greater than age 50 is currently reported at 50%, a rate higher than the national average.[11] With mortality due to malignant melanoma seeing the largest increase in the past decade, efforts at increasing the awareness of the dangers of ultraviolet exposure and the need for self-examination should be a top priority.

Screening and education also play an essential role in cervical cancer detection. Introduction of the Pap smear in the early 1940s resulted in the largest drop in mortality for any cancer from 1950-1989, and 83% of Wisconsin women over the age of 18 reported having had a Pap smear in the past 3 years.[1,12] However, the slight increase in cervical cancer mortality and the higher rates among African-American women indicate the need to address the multiple factors affecting this disease, including HPV/HIV infection, race, and socioeconomic status.[12]

The analysis of overall cancer mortality indicates some discrepancy between mortality rates among different races, with the highest rates found among blacks and the greatest increase in mortality seen among other races. These disparities have also been noted in specific cancers. The overall decline in breast

Figure 2.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cancer mortality has not been apparent among African American women in Wisconsin. From 1992-1996, mortality rates from breast cancer were 26% higher among black women compared to white in Wisconsin.[13] These disparities have also been noted in mortality rates of other cancers in Wisconsin, including cervical, prostate, and stomach cancer.[12,14-15] The reasons for these trends are not entirely clear, but are suspected to result from differences in incidence or access to screening and early treatment. Resource allocation for the coming decade, on both the state and national level, has focused on strategies to define and begin to eliminate these disparities.[16]

Finally, with the population of those age 65 and older growing at a faster rate than the entire population as a whole, the relationship between age and cancer must be considered.[17] This analysis shows that overall cancer mortality increased in the population greater than 65, with the greatest increase seen in the population age 85 and older. With the 85+ population increasing at a faster rate than the elderly population as a whole and expected to double in the next 30 years, significant increases in cancer rates may result. In 1997 in Wisconsin, men age 65 and older accounted for 64% of diagnosed cancers and 75% of cancer deaths. Wisconsin women in the same age group accounted for 57% of diagnosed cancers and 74% of cancer deaths.[1] Surveillance and planning of future cancer objectives must consider the significant effects of cancer and the aging population.

The success in reaching a number of the Wisconsin 2000 objectives should be considered an achievement in cancer control. Currently, objectives will be met in both breast and colorectal cancer, with some progress noted in reversing the steady increase in lung cancer mortality in the state. However, much work remains. Although cervical cancer accounts for relatively few deaths per year, the continued increase in mortality rates in this entirely preventable cancer highlight the importance of screening and early treatment. Furthermore, the importance of screening and education are further accentuated in the rise in mortality due to malignant melanoma in the past decade. Increased efforts also need to be placed on reducing the current racial disparities present in cancer mortality. The high rates of mortality in African-Americans and the increasing rates among other races indicate the dire need for further work in this area. Finally, the rapid aging of the population and predicted increases in the percent of the population over 85 years of age may cause a significant change in the burden of cancer in the coming years. Proper surveillance and cancer control efforts must consider these factors in the continued fight against cancer.

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A Cost Analysis of Community Screening for Diabetes in the Central Wisconsin Medicare Population

(Results from the MetaStar Pilot Project in Wausau)

Don S. Lee, BA; Patrick Remington, MD, MPH; Jimmy Madagame, MD; and Joseph Blustein, MD, MS, MPH

ABSTRACT

Context – Type 2 diabetes mellitus is often undiagnosed and untreated.

Objective – To estimate the costs and possible savings of screening for Type 2 diabetes mellitus in the Wisconsin Medicare population from a population health perspective.

Design – The costs and benefits of community screening were analyzed using various primary and secondary data sources. Data on the community screening were obtained by MetaStar, collaborators at the screening site, and published material. Results from a Monte Carlo simulation model, developed by the CDC Diabetes Cost-Effectiveness Study Group, and recent developments in diabetes research were used to estimate the incidence levels of major complications for Type 2 diabetes.

Setting and Participants– Medicare beneficiaries in central Wisconsin residing in the Wausau Hospital Service Area, which is composed of 14 zip codes.

Results – Of 826 Medicare patients screened, 32 were diagnosed as having diabetes. If we use the same assumptions offered by the CDC Study Group, we find that the excess lifetime costs from screening and early treatment ($4850) exceed costs saved from preventing complications ($378), costing an average of $4471 per diabetic. However, if we alter assumptions on cardiovascular disease reduction risk and routine care costs, we find that screening could save an average of $619 per diabetic detected.

Conclusions – The costs of community screening, using the CDC Study Group's assumptions, are greater than the costs of diabetes without screening in this population. However, recent evidence on cardiovascular disease risk and routine care costs could alter the results, leading to lower costs and greater benefits in the future. More research is necessary, particularly in the area of quality of life measures, to more accurately reflect the benefits of screening.

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INTRODUCTION

Although diabetes affects about 3% of the US population, the costs of diabetes make up about 12% of total US health care expenditures,[1] or about $100 billion per year.[2] On average, a person with diabetes spends about $11,000 per year on medical care, whereas a person without diabetes spends about $2,600.[3] Although early diagnosis and treatment to control glycemia can prevent complications,[4] some studies have shown that a person may have Type 2 diabetes for 9 to 12 years before it is diagnosed.[5]

Diabetes meets criteria for public health screening.[6] In particular, diabetes is common, it can be diagnosed in the asymptomatic phase, and early diagnosis and treatment can be beneficial to the patient in terms of slowing the progression of disease and increasing longevity.[7] However, there are also costs associated with diabetes screening, including the initial cost of screening and early treatment costs that would not have been incurred if the disease had not been detected earlier with screening. Other costs may include psychosocial costs such as misdiagnosis, iatrogenic treatment and other costs. Understanding the costs and benefits of screening for major diseases is a necessary tool to help determine health care policy and practice.

A study done by the CDC Diabetes Cost-Effectiveness Study Group provided an estimate of the lifetime costs and benefits of opportunistic screening for Type 2 diabetes in the United States.[4] The major benefits from screening were derived from additional years of life or reduced incidence of major complications including blindness, end stage renal disease, lower extremity amputation, and cardiovascular disease. The major

Table 1. Characteristics of Patients in a Community-Based Screening for Diabetes, Wausau 1998

Mean Age (Years)	72.6
Medicare beneficiaries in setting A	13,664
Medicare beneficiaries already diagnosed as diabetic	1349/13,664 = 9.9%
Undiagnosed Medicare beneficiaries eligible for screening	12,357
Medicare beneficiaries screened	826/12,357=6.7%
Medicare beneficiaries screened positive	87
Of those screened positive, those who followed up with visit to physician	75
Diagnosed as diabetic	32/826=3.9%

Note: Table reproduced from an unpublished MetaStar report.

Table 2. Lifetime Cumulative Incidence (percentage) of Diabetic Complications (65 years of age and older)

	End stage renal disease	Blindness	Lower extremity amputation	Cardiovascular disease (assumptions)*	
				1	2
Without screening	0.3	1.7	1.0	39.8	39.8
With screening	0.2	1.1	0.7	39.8	27.8
Screening effect	-0.1	-0.6	-0.3	0	-12.0

*Assumption #1 – No risk reduction (CDC)
Assumption #2 – 30% relative risk reduction (12% difference)

costs from screening were the initial cost of screening and the costs of early treatment that would not have been incurred if the disease had not been detected earlier with screening. In the CDC model, for people aged 65 or older, lifetime costs associated with routine management and treatment of major complications for diabetics in the screening group were $32,490 per diabetic. Comparable costs for diabetics of the unscreened group were $27,903 per diabetic. In other words, implementation of a national screening program for people aged 65 or older would cost an additional lifetime cost of $4587 per diabetic.

In this paper, we conducted two analyses. First, we utilized the CDC model to compare the costs of community screening and early treatment with the savings accrued from reduced incidence of major complications. Second, we altered the CDC model by assuming a 30% reduction in the risk of cardiovascular disease to reflect recent new evidence from the UK studies in 1998.[8,9] We also assessed the effect of screening on routine diabetes care. The impacts of both of these changes are presented.

RESEARCH DESIGN AND METHODS

We used the cost-effectiveness method developed by the CDC Diabetes Cost-Effectiveness Study Group.[4] The Study Group developed a Monte Carlo computer simulation model and utilized data from past clinical trials, epidemiological studies, and other sources. In their model, a single-payer system was assumed, health care providers used fasting plasma glucose tests for diabetes screening, and opportunistic screening reduced the prediagnosis interval by 5 years.

The CDC model created a hypothetical population of newly diagnosed diabetics and separated it into two groups: 1) with screening, 2) without screening. Their model then simulated the disease progression of four major complications: blindness, end-stage renal disease, lower-extremity amputation, and cardiovascular disease. The disease progressions of major complications were modeled on glycemic levels.

Community Screening

The MetaStar population included Medicare beneficiaries living in central Wisconsin. The geographic area is defined as the Wausau Hospital Service Area (HSA) and composed of 14 zip codes. The study design, implementation, and screening techniques have been reported previously.[10] Briefly, the screening was conducted on three separate days in different areas of the HSA in May of 1998. All Medicare beneficiaries age 65 and older with undiagnosed diabetes were targeted. This information was obtained from the Medicare Part A and part B claims. T hose who were previously diagnosed with diabetes were excluded from the study. Individuals who were tested positive at the screening site were then referred to a physician. See Table 1.

Brochures were sent to all targeted Medicare beneficiaries. The brochures listed risk factors for diabetes including obesity and lack of exercise. If the person had one of these risk factors (along with being over age 65), the mailing recommended that the person attend one of the screening days. The brochure stated that prizes would be given at the sites. Radio, TV, newspaper announcements, store posters, and church bulletins were used to publicize these screening days. A random blood glucose of >= 120 mg/dl was used as a positive screen.

Those who were screened positive were referred to their primary care physician or to a specific provider from a list of providers if the beneficiary did not have a primary physician. Phone call follow-ups were done if the person did not make the first appointment. Individuals involved in this project included physicians, nurses, nutritionists, hospital and clinic administrators, public health directors, and community resource staff.

Screening costs were divided between MetaStar and the community. MetaStar provided the brochure

printing and mailing. The community provided the staffing and supplies at the screening site, food and gift donations. The total cost of screening was estimated to be $3200.

Incidence of Complications

The CDC study calculates the lifetime cumulative incidence of end stage renal disease, blindness, lower-extremity amputation, and cardiovascular disease for the screened group and unscreened group as shown in Table 2. However, it does not provide the timeline for when these complications occur. We assumed that the incidence of disease increases linearly by year from zero risk, such that the total lifetime incidence equals that given by the CDC.

In addition, the CDC assumed that glycemic levels do not affect cardiovascular disease. Their study states, "Because the link between glycemic level and cardiovascular disease is uncertain, our base case model restricts the causal links to the microvascular complications, which may understate some of the benefits of early detection and treatment".[4] Since this study was published, the UK diabetes group found that glycemic control with tight blood pressure control reduces the risk of myocardial infarction by 39% for Type 2 diabetes.[8] With this new knowledge, we included in the model a reduction of risk for cardiovascular disease of 30%.

Cost Model

The costs are derived from the same sources as provided by the CDC Study Group (Table 3). The major costs are due to outpatient visits, case management, and medication. The cost of routine care for diabetics ranges from $1007 to $1277 per year. These costs are in addition to routine costs for nondiabetics (average $1939 per year). It is important to note that in the CDC model, the routine costs of treating diabetes are assumed to be unaffected by screening; however, there may be lower cost of routine treatment during the 5-year lead time period.[5] It is hypothesized that because screening allows diabetics to be detected early, many of these individuals are given less expensive regimens than the unscreened group. These less expensive regimens include fewer medications prescribed or simply diet and exercise. In this analysis, we assumed that these regimens for the screened group reduced treatment costs by one-third for the first 5 years after onset of disease. We also assumed a discount rate of 3%.

Costs are also incurred from complications. The complications reported in this paper are blindness, end-stage renal disease, lower-extremity amputation, and cardiovascular disease. The costs of these complications are also listed in Table 3.

All of these variables are year-based costs from onset of diabetes to age of death. After finding the cost for each year from onset of diabetes to death, we totaled the costs. The mean age of diagnosis with screening is 72.6, and the estimated life expectancy for men and women aged 72.6 is 9.5 years.[11] Thus, we estimated that the diabetics diagnosed during the screening will on average live to 82.1 years of age. Assuming that screening allows for earlier diagnosis by on average 5 years, and that regular diagnosis occurs on average 10 years after onset of diabetes, we calculated on average a total of 14 years from onset of diabetes to death. We assumed, as did the CDC, that life expectancy does not change with the screened group and unscreened group for individuals age 65 and older.

Table 3. Costs for Treatment, Complications, and Screening for the Cost-effectiveness Model (in dollars)

Routine Diabetic Care[1]	$1007/year
Complications[1]	
Blindness	$1997/year
End-stage renal disease	$68,131/year
Cardiovascular disease	$2757/year
Lower-extremity amputation[2]	$31,749/episode
Screening costs[3]	$100/diabetic

[1]Source: CDC
[2]The lower-extremity amputation is the average cost.
[3]Source: MetaStar. Total cost = $3200 for 32 diabetics = $100/diabetic diagnosed.

RESULTS

Of the 13,664 Medicare beneficiaries in the study area, 1349 (9.9%) were diabetic and excluded from the study. Of the remaining 12,357 beneficiaries, 826 (6.8%) were screened. Of the 826 beneficiaries screened, 32 (3.8%) were diagnosed as being diabetic.[10]

Table 4 shows the results of the cost analysis. The costs of screening the entire population were estimated to be $3200 or an average of $100 per diabetic diagnosed. The lifetime costs of diabetic routine care were $4750 greater for those detected during screening, compared to the costs if they had not been detected earlier with screening ($11,716 versus $6966). On the other hand, the costs for treatment of microvascular complications were reduced by $278 as a result of screening and the extra routine care. These costs were further reduced by $1224 assuming a 30% reduction in cardiovascular disease risk. Therefore, the excess lifetime costs associated with screening ranged from $3246 to $4471 depending on the impact on cardiovascular disease risk reduction. If the costs of routine care from early treatment for the screened group were reduced by one-third ($11,716 to $7850 per diabetic) for the first 5 years of care and we assume a 30 percent reduction in cardiovascular disease risk, screening actually saves an average of $619 per diabetic detected.

Table 4. Results of cost analysis (dollars). Average lifetime costs for screening, routine care, and diabetic complications, among persons screened and unscreened for diabetes[1]

	Unscreened	Screened[2]	Screened[3]	Screened[4]
Cardio-vascular disease	$4095	$4095	$2871	$2871
End stage renal disease	762	508	508	508
Blindness	126	74	74	74
Lower extremity amputation	240	168	168	168
Routine care	6,966	11,716	11,716	7,850
Subtotal	12,190	16,561	15,337	15,337
Screening		100	100	100
Total cost/ diabetic	12,190	16,661	15,437	15,437
Cost/ difference		+4471	+3246	-619

[1]The authors assumed a discount rate of 3%.
[2]Assumption: no cardiovascular disease risk reduction.
[3]Assumption: 30% cardiovascular disease risk reduction.
[4]Assumption: 30% cardiovascular disease risk reduction and 30% reduction in routine medical care costs.

DISCUSSION

In this study, using a cost-benefit model from the CDC, we found that the costs related to a community screening program were generally greater than the savings accrued from the reduction in the lifetime incidence of major complications. However, assuming a 30% reduction in cardiovascular disease risk and a one-third reduction in the costs of routine care for the first 5 years of care, screening led to a cost savings of $619 per diabetic detected.

The results of this study do not argue for or against screening for diabetes in the Medicare population. Rather, this study attempts to compare the economic costs associated with a Wisconsin community diabetes screening program with the savings accrued from the reduction of risk of major diabetes-related complications from a health care payer perspective. Indeed, screening policies must be developed that consider not only the economic costs and benefits, but also quality of life issues and other indirect costs and savings. While this study does not address quality of life issues, it may be that the benefits of early diagnosis of diabetes do not lie solely in dollar savings, but also in the quality of life of the diabetics detected early through screening. More research is needed to determine the true benefits of diabetes screening in the Medicare population.

Several limitations should be considered when interpreting the results. Admittedly, the CDC cost-effectiveness model was based on the US population, and we applied it to a Wisconsin population, which may not be representative of the nation. We tried to adjust accordingly by modifying the age of diagnosis of diabetes and the life expectancy of diabetics to better reflect Wisconsin. However, other differences may exist and could not be modeled, which may affect results.

Second, the cost data were obtained by the CDC and were assumed to be similar to the costs in Wisconsin. Major differences may affect the results. For example, if the cost of routine treatment nationally was significantly higher than the cost in Wisconsin, the costs associated with the screening group would be overestimated. However, if the cost related to end stage renal disease nationally was higher than the cost in Wisconsin, the costs associated with the screening group would be underestimated.

Third, differences in the incidence rates of complications may impact the model. We assumed that the incidence of complications increases linearly as time passes. The CDC study provided lifetime cumulative incidence of all major complications for both groups: screened and unscreened; however, it did not specify the time diabetics are most likely to realize these complications. We assumed that a person who had diabetes for 1 year had one-tenth the incidence for blindness as another person with diabetes for 10 years. Different assumptions in the risk of disease, such as an exponential increase in the risk of disease, would have influenced the results of the analysis.

Finally, our model does not take into account the potential differences in the prevalence rate of diabetes. The prevalence rate of diabetes would not change the results of this study, which is in costs per diabetic. However, a difference in the prevalence rate would affect the total costs associated with the screened and unscreened group.

The goal of diabetes screening is to detect undiagnosed diabetics, begin treatment, and reduce the risk of diabetes-related complications. The cost to a health care organization or health plan would include not only the costs of screening, but also the costs associated with early diagnosis and treatment. With the CDC model and some modifications to better reflect the Wisconsin Medicare population and new research, we found that the costs of community screening due to early diagnosis and treatment will be partially offset by the benefits of reduced complications. By adding the assumptions of reduced complications from cardiovascular disease and of reduced cost of routine care, we show that a community diabetes screening program can be cost saving in the long run.

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Diabetes Mortality Trends in Wisconsin, 1979–1997: The Increasing Gap Between Whites and Blacks

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ABSTRACT

Diabetes is a leading cause of morbidity and mortality in Wisconsin and the United States. We examined mortality trends for diabetes as an underlying cause of death for the years 1979-1997 for Wisconsin and the United States. Diabetes mortality rates in Wisconsin have increased over the past 18 years, from 13.5/100,000 in 1979 to 16.7/100,000 in 1997. Much of this increase is attributable to a change in the death certificate in 1989. Blacks in Wisconsin have a higher rate of diabetes mortality when compared with whites, especially among women and persons less than 65 years of age. This disparity has increased markedly over the decade. Public health efforts in Wisconsin need to focus on reducing diabetes mortality overall and on minimizing disparities in diabetes mortality between whites and blacks.

INTRODUCTION

Diabetes represents a significant health and economic burden to both Wisconsin and the United States. Diabetes is the leading cause of new cases of blindness, end-stage renal disease, and non-traumatic lower-extremity amputation, totaling an estimated $98 billion in direct and indirect costs in the United States in 1997.[1] Much of the impact of diabetes can be attributed to premature deaths. Diabetes was the underlying cause of 1179 deaths in Wisconsin in 1997.[1,2]

Both *Healthy People 2000*, the report of the national health objectives, and the Wisconsin adaptation of this report, *Healthier People in Wisconsin*, set goals for the reduction of diabetes mortality by the year 2000.[3,4] Progress reports for *Healthy People 2000* and *Healthier People in Wisconsin* suggest that objectives for diabetes mortality will not be met.[5,6]

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A core function of diabetes surveillance is to identify disparities and target populations who are at greater risk for diabetes complications. Surveillance estimates indicate that large discrepancies exist in diabetes mortality among different racial groups and between genders. In both the United States and Wisconsin, diabetes mortality disproportionately affects both the black female and American Indian populations.[1,7-8] A proposed model for *Healthy People 2010*, currently in development, suggests focusing objectives towards reducing disparities in health, such as those that currently exist in diabetes mortality.[9] This paper explores the current trends and racial disparities in diabetes mortality rates in Wisconsin.

METHODS

Diabetes mortality data from 1979-1997 were obtained from the National Center for Health Statistics using the WONDER program available from the website of the Centers for Disease Control and Prevention {http: // www.cdc.gov}. Diabetes mortality data were selected by searching for ICD-9 codes 250.0-250.9 listed as the underlying cause of death.

Death rates for the years 1979-1997 combined were stratified by race, gender, and age (35 years and older). Rates for both Wisconsin and the United States were age-adjusted using the year 2000 standard as presented by the National Center for Health Statistics.[10] All mortality rates are reported as deaths/100,000 population.

Relative risk was calculated as the ratio of rates for two populations (e.g. the rate of diabetes mortality in blacks divided by the rate of diabetes mortality in whites). The statistical significance of the relative risk was tested by calculating confidence intervals for the ratio between two rates. Confidence intervals, which did not include 1.0, were deemed significant at $p < .05$.

Prior to 1989, the Wisconsin death certificate had three lines for listing the underlying and contributing causes of death. In 1989, the National Center for Health Statistics changed the death certificate, with the addition of a line in the cause of death section.[11] This modification appears to have altered the recording of diabetes as an underlying cause of death, which resulted in an increase in the reported diabetes mortality for

Table 1. Wisconsin Diabetes Mortality 1979–1997 by Race, Age, and Gender

	Total*		White		Black		RR**
	Rate	(# Deaths)	Rate	(# Deaths)	Rate	(# Deaths)	
Age							
35–44 years	3.7	(473)	3.5	(422)	7.4	(41)	2.1
45–54 years	9.1	(849)	8.4	(747)	21.4	(71)	2.6
55–64 years	26.5	(2126)	24.7	(1907)	71.6	(157)	2.9
65–74 years	65.4	(4360)	62.9	(4087)	158.0	(198)	2.5
75–84 years	142.0	(5658)	139.8	(5475)	277.8	(141)	2.0
over 85 years	257.7	(3489)	255.6	(3412)	453.3	(66)	1.8
Gender*** (all ages)							
Male	20.4	(7481)	20.0	(7138)	34.3	(259)	1.7
Female	18.1	(9769)	17.3	(9183)	44.6	(438)	2.6
Total*** (all ages)							
Wisconsin	19.1	(17250)	18.5	(16321)	40.6	(697)	2.2
United States	19.9	(850040)	16.2	(690987)	38.6	(143641)	2.1

* Includes other races
** Relative Risk (RR): calculated as black vs. white; all RR are significant ($p<.05$)
*** Age-adjusted to year 2000 US standard[10]

both blacks and whites. Therefore, we assessed data trends, overall and by race, separately for the years 1979-1988 and 1989-1997.

The Wisconsin 2000 goal (Figure 1) was adapted from the objective for age-adjusted diabetes mortality in *Healthier People in Wisconsin*.[4] The goal (10.3/100,00) was calculated as a 15% reduction in diabetes mortality from the age-adjusted rate in 1984-1986, adjusted to the 1970 United States population. To maintain comparability, data for Figure 1 were age-adjusted to the 1970 United States population.

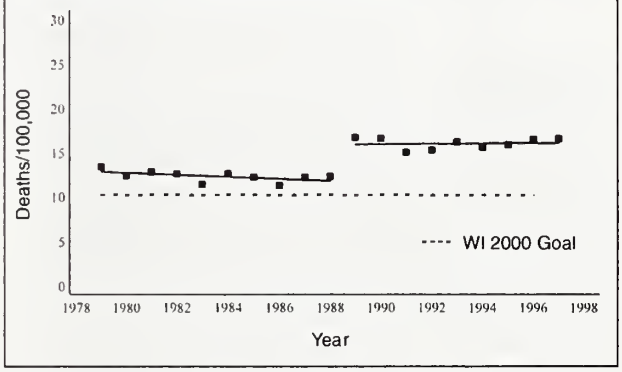
RESULTS

From 1979-1988, diabetes mortality in Wisconsin declined slightly from 13.5 to 12.4 deaths per 100,000 (Figure 1). From 1988 to 1989, following the change in the death certificate, the mortality rate increased 27%, from 12.4 to 16.8 deaths per 100,000. Since 1989, age-adjusted diabetes mortality rates have remained constant (Figure 1).

Between 1979-1997 in Wisconsin, the age-adjusted diabetes mortality rate for blacks was greater than twice the rate of whites (40.6 vs. 18.5 deaths/100,000). As seen in Table 1, this difference is almost identical to rates observed in the United States for the same time period (38.6 vs. 16.2 deaths/100,000). This difference in diabetes mortality was greatest among women in Wisconsin. The age-adjusted mortality rate among black females was 2.6 times greater than white females. Black males also have a higher mortality rate compared to white males, with a relative risk of 1.7.

In an effort to better understand the differences

Figure 1. Wisconsin Age-adjusted Diabetes Mortality 1979–1997 and the Wisconsin 2000 Goal



between white and black diabetes mortality rates in Wisconsin, data was further analyzed for both groups by age. As expected, death rates increase with age for both blacks and whites, and the overall rate for blacks in each age group is higher than the same age group in whites. The largest differences in mortality rates between blacks and whites are observed in the 45-54, 55-64, and 65-74 year age groups. Blacks in the 55-64 year age group have a mortality rate almost three times the rate of whites in the same age group (Table 1).

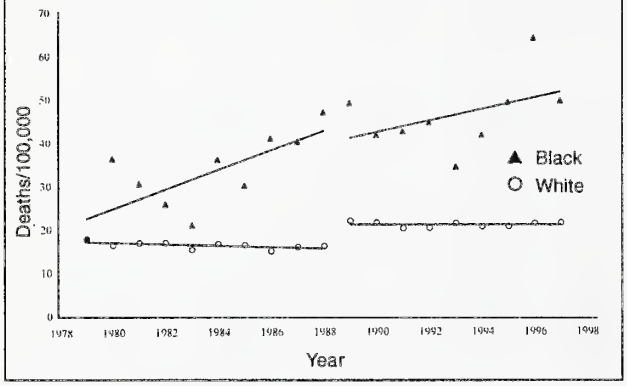
Trends in diabetes mortality in Wisconsin indicate that rates for blacks have increased from 1979-1997, while rates for whites have remained fairly constant during this time period (Figure 2). The result is an increasing gap between white and black mortality rates. In 1979-1981, the mortality rate in blacks was 1.7 times greater than whites. By 1995-1997, the black mortality rate had increased to 2.6 times that of whites (Table 2).

Table 2. Wisconsin Age-adjusted Diabetes Mortality 1979–1981 vs. 1995–1997 by Race

Year	All*	White	Black	RR**
1979–1981	17.3	16.9	28.4	1.7
1995–1997	21.8	20.8	54.0	2.6

Rates adjusted to year 2000 US standard and represent all age groups[10]
* Includes other races
** Relative Risk (RR): calculated as black vs. white; all RR are significant (P<.05)

Figure 2. Wisconsin Age-adjusted Diabetes Mortality 1979–1997 by Race



DISCUSSION

This paper demonstrates an increasing gap in diabetes mortality rate between whites and blacks in Wisconsin. Diabetes disproportionately affects blacks in Wisconsin, with a diabetes mortality rate two times greater than the diabetes mortality rate among whites. This is consistent with national trends of increasing diabetes mortality among blacks, and a previous analysis of Wisconsin data, which indicated a 56% increase in diabetes mortality among blacks from 1979-1991.[7,12,13]

Of greatest concern is the age range at which a majority of the diabetes deaths are occurring in blacks. It is expected that both diabetes prevalence and mortality increase with age.[7] However, the data indicate that blacks in Wisconsin are dying at younger ages than whites, as the relative risk of death for blacks is highest in the age groups from 45-74, with the largest risk associated with the 55-64 year age group. In this age group, the rate of death from diabetes for blacks is almost three times the rate of whites.

Some of the discrepancy between white and black diabetes mortality rates can be explained by differences in prevalence. Blacks have a higher prevalence of diabetes, with the rate of diabetes increasing three-fold in the last 30 years.[7,12,13-15] National estimates of diabetes mortality, which account for prevalence by using the population with diabetes as the denominator, eliminate some of the discrepancies between the white and black population.[7] It is difficult to do a similar analysis with the Wisconsin data because of the lack of accurate prevalence estimates and the small number of deaths for blacks. Even when differences in prevalence are considered in national data, blacks still have higher death rates among the population with diabetes.[7]

A number of additional factors may contribute to the increasing disparity between white and black diabetes mortality rates. The greater prevalence of risk factors, including obesity, hypertension, physical inactivity, and smoking, among the black population may contribute to an increased number of deaths associated with diabetes.[16] Furthermore, socioeconomic barriers, including lack of access to health care, educational attainment, and income, may also play an important role in the increasing disparity.[16]

Mortality rates are based on death certificate reporting, and diabetes mortality rates are often subject to underestimation due to underreporting.[12,17] Evidence of underreporting is supported by the increased death rates after 1989, as seen in Figures 1 and 2. In 1989, an additional line was added to the standard death certificate in an effort to obtain more complete reporting of cause of death.[11] The addition of this line is of particular importance to diabetes mortality, as the frequency of recording of diabetes declines sharply with age due to the multiple chronic conditions that are often present in older populations.[18] In an earlier analysis of Wisconsin mortality data, it was difficult to determine if the increase in diabetes mortality was associated with the changes in the death certificate.[12] Examining Figures 1 and 2, it is clear that changes in the death certificate did result in an increase in the reporting of diabetes mortality, such that the reported diabetes mortality rate after 1989 may better represent the true rate of diabetes mortality. However, there is no evidence that the change in the death certificate disproportionately affected blacks, and therefore the change cannot be considered as a contributory factor to the increasing gap in mortality rates between blacks and whites.

Wisconsin will not meet the year 2000 objective for diabetes mortality.[4,6] This is partly due to the change in the death certificate, which resulted in an increase in diabetes mortality. The goal of 10.3/100,000 was calculated using 1984-1986 data, and it does not take into account the increase in diabetes mortality seen after the change in the death certificate. However, the year 2000 goal would not be met even when adjusting for the change in the death certificate by using 1989-1991 data. As seen in Figure 1, the trend over time indicates a steady rate since 1990. The downward trend necessary for achieving the year 2000 goal has not occurred, which may be due, in part, to the increasing mortality among blacks.

In conclusion, overall diabetes mortality rates in Wisconsin have been relatively unchanged over the past

decade. However, the gap in diabetes mortality rates between whites and blacks has increased considerably. This gap can partially be explained by the increased prevalence of diabetes among blacks. However, diabetes is placing a large burden on the black population, particularly younger ages and black females. Prevention must focus on this population in an effort to move towards the national and state objectives of reducing health disparities as proposed for *Healthy People 2010.*[9]

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The Wisconsin Collaborative Diabetes Quality Improvement Project

Lynn Quenan, MS; Patrick Remington, MD, MPH; Faye Gohre, RN, BSN; and Patricia Zapp

ABSTRACT

Introduction: Performance measurement is an important tool for improving the quality of diabetes care. In this report we describe the Wisconsin Collaborative Diabetes Quality Improvement Project, designed to assess the quality of diabetes care among 18 health care organizations in the state.

Methods: Fifteen health maintenance organizations, a tribal council, a health care provider, and an insurance corporation participated in the project. Each health care organization reported the percent of their diabetes population who had received selected measures of diabetes preventive care during the reporting year, using HEDIS® performance indicators.

Results: The proportion of the population with diabetes receiving preventive care varied by indicator: retinal eye exam (ages > 31 years: 55%; ages 18-75 years: 48%), annual lipid profile (58%); hemoglobin A1c (81%); and nephropathy screening (27%). Rates also varied among health maintenance organizations for each indicator, with rates varying three-fold between organizations for the retinal eye exam indicator (ages > 31 years).

Conclusions: These data demonstrate considerable variability in the delivery of preventive services to this population with diabetes. The collaborative group involved in this project is currently exploring further collaborative quality improvement opportunities.

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INTRODUCTION

Performance measurement has become an important tool for improving the quality of health care delivery in the United States.[1] The Health Plan Employer Data and Information Set (HEDIS®), currently managed by the National Committee for Quality Assurance (NCQA) and utilized in their accreditation program for managed care organizations, is a standard for performance measurement. Beyond its use for accreditation, HEDIS® is a valuable source of information for consumers and employers, as performance and quality have become meaningful measures to consider when purchasing health care.[2]

Since the publication of the Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study (UKPDS), which indicated the effectiveness of intensive therapy for the population with diabetes, efforts have been made to identify indicators to measure appropriate diabetes care.[3,4] The Diabetes Quality Improvement Project (DQIP), a collaborative effort of NCQA and a variety of partners, has compiled a number of these indicators into the Comprehensive Diabetes Care section of HEDIS® reporting. This reporting was voluntary in 1999 and is mandatory for 2000.[2,5]

Currently, efforts to use diabetes quality indicators to improve diabetes care, such as HEDIS®, follow a competitive market model. That is, health plans attempt to improve their measures through quality improvement initiatives, in order to gain a competitive edge among health care purchasers. These quality improvement initiatives are often developed in isolation, with few opportunities to share successful strategies and lessons learned.

This report describes the Wisconsin Collaborative Diabetes Quality Improvement Project. This unique project was designed to assess the current level of preventive diabetes care, as outlined by HEDIS®, in an effort to collect baseline population data to assess the standard of diabetes care in Wisconsin. The purpose of this project was to use existing performance measurements, not only as a comparison tool for baseline data collection, but also as the basis for sharing sessions, data systems improvements, and collaborative projects

among health maintenance organizations and interested health care organizations in Wisconsin.

METHODS

Invitations to participate in the Wisconsin Collaborative Diabetes Quality Improvement Project were mailed to the 24 licensed health maintenance organizations in Wisconsin and, additionally, to the health system members of the Wisconsin Diabetes Advisory Group Quality Improvement Workgroup. The invitations included an introductory letter, a project description, and a project agreement. Organizations interested in participating were asked to return a signed project agreement indicating their intent to complete the project objectives.

Project participants were asked to submit data that reflected the level of diabetes care in their organization. The project was designed to keep data collection methods consistent with current HEDIS® definitions provided by NCQA in an effort to reduce the burden of data collection, while still obtaining valuable information on diabetes care.[5] Because of the changes being implemented for diabetes reporting by HEDIS®, data was collected in two time frames. Participants were required to report data pertaining to the 1999 HEDIS® definition for retinal eye exam by September 30, 1999 (retinal exam for > 31 years of age). Collaborators were then encouraged to submit any data available on the HEDIS® Comprehensive Diabetes Care measures by December 31, 1999. The Comprehensive Diabetes Care measures are limited to individuals with diabetes 18-75 years of age, and include additional measures of lipid profile, hemoglobin A1c (HbA1c), and nephropathy testing, as well as the retinal eye exam. Since reporting of the Comprehensive Diabetes Care indicators was voluntary for 1999 but is required by HEDIS® for 2000, this project was presented as an opportunity for participants to practice collecting these measures and implement upgrades in their data systems to achieve appropriate collection for the next reporting year. Limited funds were provided to assist participating organizations with the refinement of data systems for diabetes quality improvement.

Participating organizations completed a data collection tool for each of their representative populations (commercial, Medicare, and Medicaid). Participants reported information on their data collection methodology, sample size, eligible population, and percent of individuals receiving the indicator. To maintain confidentiality, code letters were randomly assigned to each participant and remain consistent throughout the report. All reporting of data summaries utilizes these letters. Participants were provided with their code letter for comparative purposes.

The eligible population for this study was defined as any individual with diabetes meeting the continuous enrollment definition in a managed care organization or health care delivery system.[5] Individuals with diabetes were defined as those who were taking insulin and/or oral hypoglycemics/antihyperglycemics during the reporting year or had two encounters with a physician or one encounter in an emergency or inpatient setting with a diagnosis of diabetes. Aggregate percentages were calculated as weighted averages of the number of people receiving the indicator divided by the total eligible population.

Table 1. Population Distribution of HMO Collaborators by Payor for Retinal Eye Exam (age > 31 years)

Payor	Population	% of Total Population	Sample Size
Medicaid	158	0.8%	156
Medicare	1,786	9.0%	543
Commercial	17,890	90.2%	6,125
Total	19,834	100.0%	6,824

Table 2. Summary of Percent of Diabetes Population Receiving Diabetes Indicators Submitted by HMO Collaborators

	Commerical		Total*	
	Percent Population Receiving Indicator	Total Population	Percent Population Receiving Indicator	Total Population
Retinal Eye Exam (>31 years)	55%	(17.890)	55%	(19,834)
Retinal Eye Exam (18-75 years)	48%	(11,004)	48%	(12,542)
Annual Lipid Profile	58%	(11,092)	57%	(13,230)
1/more HbA1c	81%	(12,640)	81 %	(14,778)
Nephropathy Screening	29%	(11,092)	27%	(13,230)

*Total Population includes commercial, Medicare, and Medicaid populations

Project agreements were received from 17 interested organizations, including 14 health maintenance organizations, a tribal council, a health care provider, and an insurance corporation. An additional health maintenance organization joined the project during the second phase of data collection, bringing the total number of collaborators at project completion to 18. Because of concerns about patient overlap and differences in data definitions, aggregate calculations only include data from health maintenance organizations.

RESULTS

The participating health maintenance organizations are widely distributed across the state of Wisconsin (Figure

Figure 1. Percent of Total HMO Population by County in Wisconsin Represented by HMOs Participating in the Wisconsin Collaborative Diabetes Quality Improvement Project

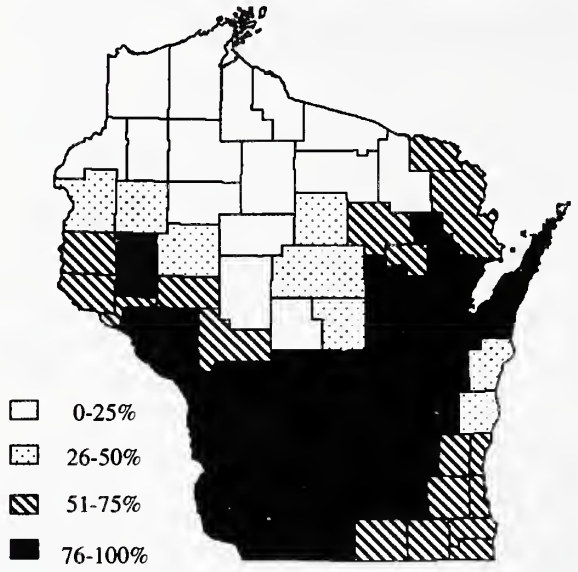
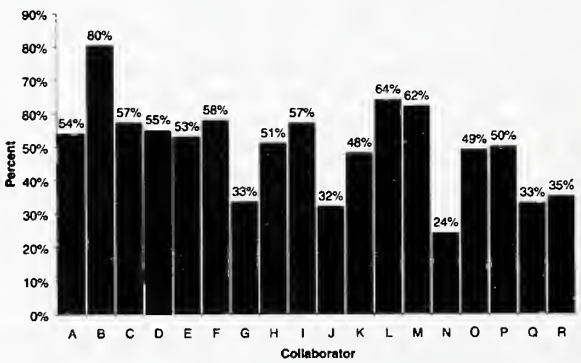


Figure 2. Percent Retinal Eye Exam (age > 31 years) by Collaborator*



*Data for HMO Collaborators represents commercial population

1). Of the greater than 1.5 million individuals in Wisconsin currently enrolled in a health maintenance organization (HMO), 68% are represented in this project.[6] In 23 counties, greater than 75% of the current enrolled managed care population is represented by an HMO collaborating in this project. The 17 counties with the least representation in this project account for only 6% of the total state population currently enrolled in an HMO. All collaborators provided information for their commercial populations, while only three collaborators also supplied data for either a Medicaid or Medicare population. Therefore Medicare and Medicaid participants comprised only 9.0% of the total study population (Table 1). In this project, four of the 15 HMOs collected data using only administrative data to track their indicators. The remaining HMOs collected data using the hybrid method.[5]

All collaborators submitted data corresponding to the 1999 HEDIS® definition of retinal eye exam, which measures the population with diabetes greater than 31 years of age who had an eye screening for retinal disease. Of the commercial HMO study population, 55% received an eye exam in the last year, which was identical to the level of screening maintained in the total population (commercial, Medicare, and Medicaid combined). The level of screening ranged from a high of 80% to a low of 24% among collaborators, and commercial percentages were based on a sample population of 6125 individuals with diabetes (Table 1-2, Figure 2).

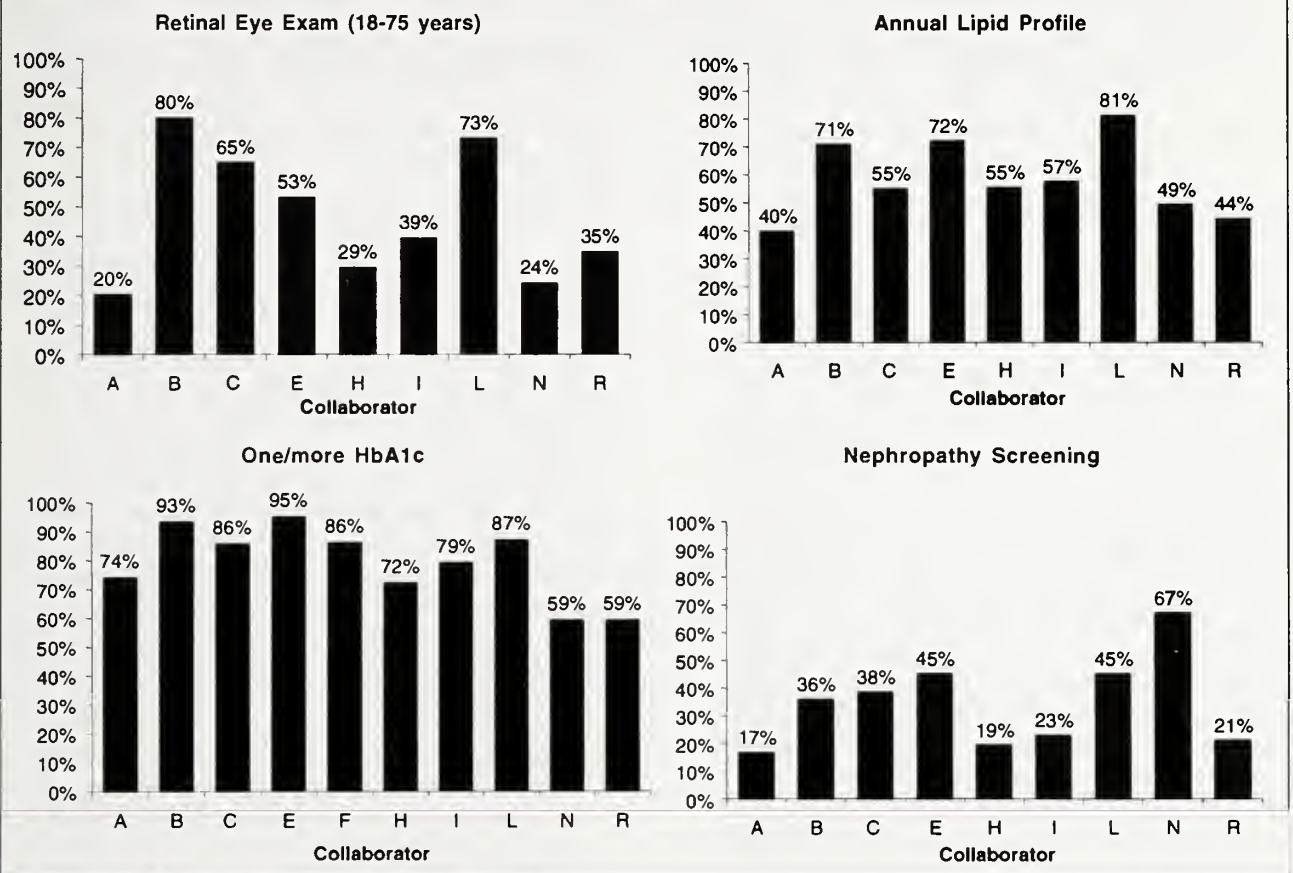
Nine participants submitted additional data in accordance with the HEDIS® Comprehensive Diabetes Care measures, including the retinal eye exam, annual lipid profile, and nephropathy screening. An additional participant submitted data for the HbA1c indicator. Participants are identified by the same code letter in Figures 2 and 3. The HbA1c indicator had the highest level of screening for the commercial population at 81%, and nephropathy screening the lowest at 29% for the commercial HMO population. Similar to the first retinal eye exam measure, there is much variability between the participants in the completion of each indicator (Figure 3). A summary of the data collected from all HMOs for the commercial and total populations is presented in Table 2.

DISCUSSION

The State of Managed Care Quality 1999, compiled by NCQA and based on quality information submitted by hundreds of managed care organizations nationwide for use in Quality Compassä 1999, indicates the national average for retinal eye exam (age >31 years) in the population with diabetes is 41%. NCQA regional data for East North Central, which includes Wisconsin and four other Midwestern states, reports an average of 43% of the population with diabetes received a retinal eye exam in the 1998 reporting year.[7] The aggregate data of our study indicate 55% of the commercial HMO study population received a retinal eye exam, a mark well above both the national average of 41% and regional average of 43%. Our data indicate that six of the HMOs participating in this study have achieved the 90th percentile benchmark level of 57% maintained by NCQA. Comparison data for the Comprehensive Diabetes Care measures are not yet available from NCQA.

The collection of Medicare and Medicaid data was not a major focus of this project, and only a few collaborators reported data pertaining to these populations. The Medicare indicators, in particular, were affected by the changing age parameters in the Comprehensive

Figure 3. Percent Comprehensive Diabetes Care Measures by Collaborator*



*Data for HMO Collaborators represents commercial population

Diabetes Care measures, as many HMOs have a significant population with diabetes over the age of 75. The reported Medicaid population in this study is too small to complete an analysis. However, the Wisconsin Medicaid Program, which collected data for HbA1c, reported a level of 58% for one/more HbA1c for the HMO Medicaid population in 1997.[8]

Some of the variability between participants can be attributed to the variety of organizations that participated in this project and the differences in their health care delivery systems. However, variability is also seen between the different health maintenance organizations, which may reflect the effects of a number of factors. Since the data are based on the information available through data systems and medical documentation, the accuracy and ease with which these data can be retrieved may influence the results. Particularly, a number of HMOs indicated difficulties accessing data pertaining to continuous enrollment with their current computer systems. Many managed care organizations have tried to streamline this process through diabetes registries, systems updates, and improvements in medical documentation. The managed care delivery model may also be a factor in this variability. Representation of group, independent practice association (IPA), network, and staff model organizations were present in this study, and percent retinal eye exam (>31 years) ranged from 51%-56% among these models. Although the sample size for each model is not large enough to draw any conclusions, differences in the delivery model of HMOs represents an important challenge for research involving managed care organizations.[9,10]

Also of interest are the differences in each organization's experience with the collection of HEDIS® data. A number of participants had a great amount of experience with HEDIS® collection and had completed an external data auditing process necessary for NCQA accreditation. In contrast, a handful of participants had never worked with HEDIS® measures prior to this project.

In addition there was variation in the approaches used to collect data. For this project, organizations could retrieve data utilizing only administrative records or through the hybrid method, which combines transaction and medical record data. Typically it is thought that the hybrid method more accurately captures the measured indicators, and this method is required for HEDIS® collection in 2000.[5,8] In this

project, four of the 15 HMOs used only administrative data to track their indicators.

Finally, there is some intra-plan variation in organizations that submitted both the initial retinal eye exam measure and the Comprehensive Diabetes Care measures. This variation may in part be due to the different population structure of the measures, with the initial eye exam measure covering populations greater than 31 years of age and the comprehensive measures covering those 18-75 years of age. Furthermore, because this is the first year most of the organizations have collected the comprehensive measures, this data may be more susceptible to limitations in data collection and methodology.

A number of limitations should be noted in the reporting of this data. First, because this study focuses on information from HMOs, the results do not present a statewide picture of diabetes care for all individuals, especially those with diabetes who are uninsured or insured through other means. Also, due to the small sample size of the Medicare and Medicaid populations in this study, this data cannot be extrapolated to the state Medicare and Medicaid diabetes populations. Furthermore, inadequate sample size, regional variability, and differences in enrollment prevent comparisons between the commercial, Medicaid, and Medicare data. Finally, all of the data in this study were collected separately by each participant and are subject to the variability inherent in each organization's ability to abstract data. The design of this study and the use of HEDIS® definitions for data abstraction were implemented to limit the effects of this variability.

Although all HMOs in the state were invited to participate, a number of HMOs declined. This project did not specifically address non-participant data or reasons for non-participation. However, a number of non-participants indicated time constraints and a lack of resources within the organization as factors in their decision.

The Wisconsin Collaborative Diabetes Quality Improvement Project follows the publication of the *Essential Diabetes Mellitus Care Guidelines* by the Wisconsin Diabetes Control Program Advisory Group in March of 1998.[11] The goal of these guidelines is to improve the status of diabetes care through providers and health systems. Currently, 19 of the 24 health maintenance organizations in Wisconsin have adopted or adapted these guidelines, with the remaining five organizations utilizing comparable diabetes guidelines. This project was developed as an attempt to assess implementation of appropriate diabetes care in Wisconsin by collecting baseline data on diabetes quality indicators, as well as to encourage collaboration among a variety of health care delivery systems. The project was successful in both objectives, and the collaborative group involved in this project is currently exploring further quality improvement and sharing opportunities.

ACKNOWLEDGEMENTS

This project was supported by the Wisconsin Diabetes Control Program and the Diabetes Advisory Group Quality Improvement Workgroup. The authors of this report would like acknowledge the many individuals whose collaborative efforts made this project possible: the Bureau of Chronic Disease staff, including Peter Rumm, MD, Nancy Chudy, and Liz Miller; the Steering Committee of the Quality Improvement Workgroup (Joe Blustein, MD, and Judy Frisch of MetaStar, and Sandra Mahkorn, MD); the members of the Quality Improvement Workgroup and the Public Health Initiative. Most importantly, we would like to recognize the following organizations for their participation in this project: Gundersen Lutheran Health Plan, Group Health Cooperative of South Central Wisconsin, Touchpoint Health Plan, Network Health Plan, Prevea Health Plan, Greater La Crosse Health Plans, Inc., Family Health Plan Cooperative, Valley Health Plan, Physicians Plus Insurance Corporation, Unity Health Plans, Great Lakes Inter-Tribal Council, Dean Health Plan, Inc., North Central Health Protection Plan, Wisconsin Physicians Service, Advanced Health Care, UnitedHealthcare of Wisconsin, Inc., Humana EMPHESYS, Humana WHO.

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Increasing Prevalence of Overweight Among Wisconsin Adults, 1989–1998

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ABSTRACT

Objectives: Overweight is an important condition that increases the risk of chronic diseases such as diabetes, heart disease, and cancer. We examined trends in overweight prevalence among Wisconsin adults from 1989 to 1998 and assessed progress in reaching the overweight 2000 goal for Wisconsin.

Methods: We used data on the self-reported height, weight, and calculated body mass index from the Wisconsin Behavioral Risk Factor Survey to examine overweight prevalence trends among Wisconsin adults.

Results: The prevalence of overweight has increased over 40% during the past decade from 23% of adults in 1989, to 34% of adults in 1998. The increase occurred in men and women, blacks and whites, and all age groups. In 1998, 330,000 more adults were overweight in Wisconsin, compared to 1989.

Conclusion: As rates of overweight continue to increase, the incidence and prevalence of many chronic diseases will also increase. Effective population-based efforts are required to reduce caloric intake and increase physical activity among Wisconsin adults.

INTRODUCTION

Overweight is an important and costly condition that increases the risk of chronic diseases such as diabetes, cardiovascular disease, hypertension, dyslipidemia, gallbladder disease, sleep apnea and some types of cancer.[1] In 1995, the direct monetary cost of obesity (body mass index ≥ 30 kg/m^2) in the United States was an estimated $70 billion.[2] The prevalence of overweight among US adults is increasing. The age-adjusted prevalence of overweight (body mass index 27.8 for men, 27.3 for women) in US adults increased 30%, from 25% of adults in 1976-1980 to 33% of adults in 1988-1991.[3]

In 1988, 28% of Wisconsin adults were overweight based upon body mass index.[4] The *Healthier People in Wisconsin: A Public Health Agenda for the Year 2000* set a goal to reverse this trend, and reduce the prevalence of overweight to no more than 25% of the adult population by the year 2000. The purpose of this study is to examine trends in overweight prevalence among Wisconsin adults between 1989 and 1998 and to assess Wisconsin's progress in reaching the overweight prevalence goal as stated by *Healthier People in Wisconsin.*[5]

METHODS

The data were obtained from the Wisconsin Behavioral Risk Factor Survey (BRFS) from 1989-1998, part of the national Behavioral Risk Factor Surveillance System (BRFSS) coordinated by the Centers for Disease Control and Prevention (CDC).[6,7] The BRFSS is a national state-based surveillance system that collects data regarding risk behaviors among non-institutionalized residents ages 18 and older.[7] Each month, states select a random sample of adults to participate in a telephone interview to collect data regarding the prevalence of risk behaviors in the adult population.

To examine trends in overweight prevalence in Wisconsin, we analyzed data on the self-reported height, weight, and calculated body mass index (BMI). Body mass index is calculated by dividing the weight (kg) by the height (meters) squared (kg/m^2). In this analysis, overweight was defined as a BMI of 27.8 or greater for men and 27.3 or greater for women.[6] The prevalence data are expressed as the percent of the population who are overweight based on BMI.

Trends in overweight were calculated in two ways. First, overall trends in overweight for all adults from 1989 to 1998 were calculated using linear regression in Microsoft Excel.[8] Second, trends by age, gender, and race/ethnicity were determined by calculating the percent change in overweight in 2-year periods from

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Table. Trends in Overweight Prevalence of Wisconsin Adults Population 1989-1998

	Percent (n)		Absolute difference	Relative change (%)
	1989–1990	1997–1998		
TOTAL	23.1 (2536)	32.9 (4450)	9.8	42.5
Sex				
Men	24.1 (1176)	36.0 (1969)	11.9	49.2
Women	22.1 (1360)	30.0 (2481)	7.9	35.8
Age				
18-24	9.7 (295)	17.2 (369)	7.5	76.8
25-34	18.8 (672)	26.7 (884)	7.9	42.1
35-44	21.9 (544)	31.5 (1057)	9.6	43.6
45-54	34.0 (293)	38.7 (786)	4.6	13.7**
55-64	36.9 (252)	43.0 (528)	6.2	16.7**
65+	23.9 (480)	40.4 (812)	16.5	68.8
Race				
White, non-Hispanic	22.7 (2363)	32.5 (4029)	9.8	42.9
Black, non-Hispanic	33.4 (90)	44.7 (223)	11.3	33.8**
Hispanic	21.0 (47)	39.6 (80)	15.0	68.7**

Overweight is defined as a BMI of 27.8 or greater for men and 27.3 or greater for women.
* P-value < 0.02

1989-1990 to 1997-1998. Combining two years of data increased the precision of the prevalence estimates for these subgroups.

A Mantel-Haneszel chi-square test was performed using Epi Info 6, a statistics program, to determine the statistical significance of the relative changes in overweight prevalence in Wisconsin.[9] Because of the complex survey design, we used a p-value of 0.02 to determine the statistical significance. We estimated the increase in the number of persons who are overweight in the state using indirect age standardization. To determine the number of "expected" overweight persons, we multiplied the 1989-1990 age-specific rates by the 1998 age-specific population. To determine the increase in the number of overweight persons, the calculated "expected" prevalence was subtracted from observed prevalence in 1998. These numbers were rounded to the nearest thousand.

RESULTS

The prevalence of overweight in Wisconsin has increased steadily over the past decade from 23% in 1989 to 34% in 1998 (Figure 1). This represents an increase of over 1% per year (slope=1.14).

Gender: The prevalence of overweight increased among both men and women from 1989-1990 to 1997-1998 (Table). The largest increase in overweight prevalence was among men (49%, p <0.001) compared to women (36%, p <0.001). In 1989-1990, the prevalence of overweight was the same among men and women. By 1997-1998, the prevalence of overweight was higher among men compared to women.

Age: The prevalence of overweight increased among all age groups between 1989-1990 and 1997-1998 (Table, Figure 2). The largest increase in overweight prevalence was among adults ages 18-24 with over a 50% increase in overweight prevalence (p = 0.01). In both time periods, the prevalence of overweight increases with increasing age, peaking among persons aged 55-64, and declining among persons over 65 years of age (Table, Figure 2).

Race: The prevalence of overweight increased among whites, blacks, and Hispanics in Wisconsin from 1989-1990 to 1997-1998 (Table). In 1989-1990 and 1997-1998, the black (non-Hispanic) population in Wisconsin had a higher prevalence of overweight compared to the white population.

Public Health Impact: If the prevalence rate in 1989-1990 had continued, there would have been 930,000 adults who were considered overweight in 1998. However, in 1998, there were actually an estimated 1,390,000 adults in Wisconsin who were overweight; 370,000 more persons than expected. The *Healthier People 2000* goal for Wisconsin was to reduce overweight prevalence to no more than 25% of the adult population. However, in 1998 34% of the adult population in Wisconsin was overweight (Figure 1).

DISCUSSION

Since 1989, there has been a progressive increase in overweight prevalence among Wisconsin adults. The increase has occurred among all age groups, both genders, and among both racial groups. The increase, however, was most striking among young adults, men, and whites in Wisconsin.

The increase in overweight among Wisconsin adults was similar to national trends in overweight prevalence among adults. Nationally, from 1988 to 1991, the overweight prevalence increased the most among men and whites, similar to changes in Wisconsin between 1989-1990 and 1997-1998.[3] Nationally, the overweight prevalence is higher among men, non-whites, and the middle-aged population.[3,10]

Several risk factors have been identified that predispose individuals to being overweight, including genetics, diet, and physical activity.[11] Of these, however, only changes in diet and physical activity could explain the recent increases in overweight. The determinants leading to the energy imbalance are multi-factorial including an inadequate knowledge of food consumption and a lack of physical activity.[3] Although data on diet and exercise are limited in Wisconsin, national studies indicate that 80% of US adults are at risk for health problems related to lack of exercise, regular and sustained physical activity.[12]

Changes in the social environment may contribute to the increased energy imbalance among US and Wisconsin adults. In general, the US environment discourages regular physical activity and promotes excessive food consumption.[13] We now live in a social environment with easy access to calorie-dense food. For example, there is increasing availability of high calorie food in work-sites and schools; fast-food restaurants provide access to super-sized portioned high-fat foods. In addition, advances in technology have made it easier to live a sedentary lifestyle.[11,13] With access to cars, computers, and television it is no longer "necessary" to incorporate physical activity in our daily routine.

The increasing prevalence of overweight in Wisconsin has a number of implications related to chronic disease and psychosocial disorders. The risk of various chronic health conditions increases as BMI increases above 20 kg/m^2.[11] Overweight increases the risk of hypertension, diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, and various cancers.[11,14] For example, the risk of developing diabetes is 2.9 times greater for people ages 20-75 years old who are overweight relative to those who are not overweight in the same age range.[15] In addition to an increased risk of chronic conditions due to overweight and obesity, there are also a number of psychosocial effects of being overweight.[11] Many studies have illustrated effects of being overweight with depression, discrimination, social stigmatization, eating disorders, poor self-image and reduced quality of life being the most common.[11,16,17]

Figure 1. Overweight Prevalence in Wisconsin: 1989–1998.

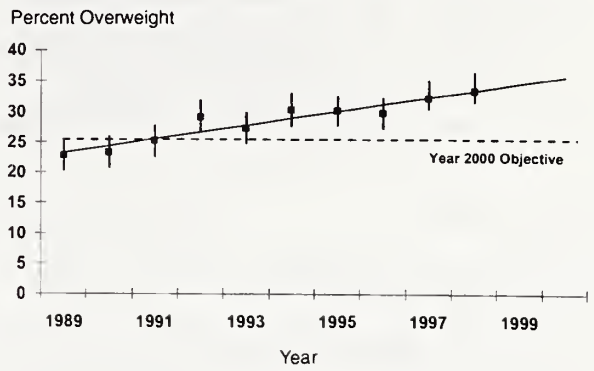
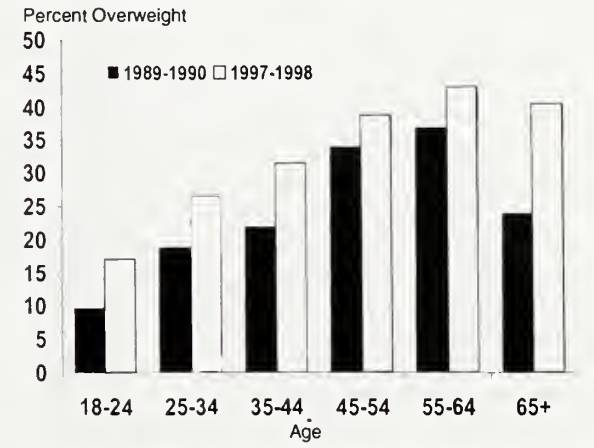


Figure 2. Age-Specific Trends in Overweight Prevalence Among Wisconsin Adults, 1989–1990 to 1996–1998



Several limitations in this analysis should be considered. First, BRFSS is based on self-reported information on weight and height from participants. Studies suggest that people who are overweight tend to underestimate their weight.[18] In addition, the BRFSS is a telephone survey; those without a telephone, usually individuals in the lower socioeconomic gradient, are not surveyed. Both of these limitations associated with BRFSS may lead to an underestimation of the overweight prevalence in Wisconsin.[18] However, since the same methods have been used for the past decade, these biases would not affect the estimates of change in overweight prevalence in this analysis.

Finally, the definition of overweight is often inconsistent between various studies, making comparisons between Wisconsin results and other national and international analyses difficult.[18] In 1997, the Dietary Guidelines Committee set a BMI of 25.0 as the upper limit of healthy weight for both men and women; it was

concluded that the risk for mortality increases significantly with a BMI over 25.[20] Using that definition of overweight at ≥25.0 BMI, 56.5% of Wisconsin adults were overweight in 1998.[10] However, using the older definition (27.8 BMI for men, 27.3 BMI for women), about one-third of adults in Wisconsin were overweight in the same year.

CONCLUSION

The prevalence of overweight is increasing in Wisconsin at an epidemic rate; it is clear that the *Healthier People 2000* goal for overweight prevalence among Wisconsin adults will not be reached. The factors contributing to the increase in overweight prevalence are multi-faceted; thus, a multi-faceted approach should be taken to reduce the prevalence of overweight among Wisconsin adults.[21]

As rates of overweight continue to increase, the incidence and prevalence of many chronic diseases will also increase. Effective population-based efforts are required to increase physical activity and reduce caloric intake among adults in Wisconsin. Public health messages on reducing overweight prevalence among Wisconsin adults should focus on balancing caloric consumption with appropriate physical activity. Health care providers should continue to work with all of their patients promoting healthy diets and encouraging regular physical activity.

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Too Many Treatments for Parkinson's Disease: How Should They Be Used?

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ABSTRACT

Surgical ablation for Parkinson's disease was abandoned in the 1970s after successful clinical trials of L-DOPA and L-DOPA/decarboxylase inhibitor combinations and early dopamine receptor agonists were added to prolong a viable therapeutic window beyond 5 years. The development of newer agonists with variations in receptor subtype specificity and new enzyme inhibitors with combinations of central and peripheral effects have continued to attract attention as therapeutic alternatives. Treatment options are now coming full circle with a rebirth of stereotactic neurosurgical alternatives to a wide variety of pharmacologic paradigms. The authors propose a rationale for selecting differing treatment options within historical perspective and modern treatment goals using both medical and surgical alternatives.

HISTORICAL PERSPECTIVE

Parkinson's disease (PD) involves some combination of the cardial signs of bradykinesia, rigidity, tremor, and postural instability. One additional major contributor of disability is now recognized as dementia. Although the large cooperative study, known as DATATOP,[1] has failed to define an effective neuroprotective strategy for our patients, it nevertheless has provided some insight into prognosis based on historical outcomes from three categories of patients. Tremor-predominate PD generally has a good prognosis for the maintenance of mobility, typically uncomplicated by dementia, whereas bradykinesia-predominate PD leads to a more rapid impairment of mobility. Although estimates vary, up to 40% of patients with bradykinesia-predominate PD are at risk for major problems with dementia.[2]

In James Parkinson's original description of Paralysis Agitans, "the shaking palsy," in 1817[3] a clear description of the overt motoric aspects of PD was proposed. This description claimed an absence of dementia and sensory abnormalities as the motoric signs of tremor, motor slowing, and postural instability progressed. Rigidity due to painful tight muscles was not described because of the manner of physical examination in vogue at the time. The well-dressed physician with top hat, watch chain, and walking stick would not think of touching his patient directly, but rather he would use detailed inquiry and observations of motor performance to make his assessment. He might lift a garment with his meter-long walking stick to clear his view for one aspect or another in the presence of "copious salivary secretions." (We now find the rigidity and cogwheeling by forthright manipulation of the neck and limbs. On the other hand, it is curious that the Hoehn and Yahr Scale for PD disability practically ignores the relevance of tremor to disability in favor of signs affecting ambulation.[4])

Table 1. Cardinal Signs of Parkinson's Disease

- Resting Tremor
- Axial and Limb Rigidity
- Bradykinesia (And Bradyphrenia)
- Postural Instability

Pharmacologic intervention for PD (see Table 3) was initiated in 1860 by Charcot[5] with extracts from plants containing atropinic compounds, later to be improved by the synthesis of artificial anti-cholinergics in the 1940s. Popular modern usage includes trihexyphenidyl (Artane) and benztropine (Cogentin). Although still effective in early stages with a view towards forestalling or limiting doses of L-DOPA and to help prevent dyskinesias, anticholinergics are often ineffective in controlling tremor despite the claims of most classical textbooks.

Wilson[6] drew attention to the deep nuclei (including the basal ganglia) in 1912 which led the way to exploratory surgical lesions in the globus pallidus and thalamus to reduce or ablate motoric signs. Thalamotomy was especially useful for tremor but in the absence of stereotactic maps based on anatomic details of pallidal outflow tracts and modern brain scanning, errors of even a few millimeters using stereotactic frames could

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Table 2. Evolving Treatment Strategies

1817	James Parkinson: Paralysis Agitans[3]
1860	Charcot: Atropinic Plant Extracts[3]
1912	Wilson: Role of Basal Ganglia[8]
1940s	Synthetic Anticholinergics
1942	Meyers: Status Of Ablative Surgery[11]
1957	Carlsson: Dopamine Mechanism In Animals[13]
1960	Ehringer: Dopamine Mechanism in Humans[14]
1967	Cotzias: L-DOPA Success In Humans
1970s	L-DOPA Agonists, Add-on Therapy
1972	Papavasiliou: Peripheral Decarboxylase Inhibitors (Carbidopa)[16]
1975	Birkmayer: Central Dopamine Extenders (selegiline)[20]
1979	Davis: MPTP-induced Parkinsonism[19]
1979	Bjorklund: Intracerebral Nigral Transplants[25]
1985	DeLong: Pallidal Outflow Tracts/Rebirth of Stereotactic Surgery[23,24]
1990s	Introduction of COMT Inhibitors: Tolcapone and Entacapone[21]

Table 3. Treatment Modalities

(A)	Tremor (Resting or Action): Pramipexole Thalamotomy (Vim) Thalamic Deep Brain Stimulation
(B)	Rigidity, Bradykinesia, Some Tremors: Anti-cholinergics L-DOPA (Sinemet) Dopamine Agonists Pallidotomy (mPVP)
(C)	End of Dose Failure: Add-on Agonists COMT Inhibitors MAO(B) Inhibitors Decarboxylase Inhibitors
(D)	Motor Fluctuations: ↓Sinemet COMT Inhibitors Agonists with ↓Sinemet Pallidotomy (mPVP)
(E)	Total Medication Failure: Pallidotomy (mPVP) Pallidal Deep Brain Stimulator

produce disastrous effects[7] and bilateral lesions appeared to increase the risk of dementia.[8,9]

Animal studies implying a dopamine mechanism of Parkinsonian signs in 1957[10] and postmortem findings of dopamine deficiency in the striatum of the basal ganglia in 1960[11] eventually led to the report of successful trials of the dopamine precursor, L-DOPA, by Cotzias in 1967.[12] The use of oral L-DOPA and its less toxic and more potent cousin, carbidopa-levodopa (Sinemet®), dominated treatment preferences and overshadowed further stereotactic treatment alternatives until the 1990s when disenchantment with medical treatments and new discoveries of pallidal outflow tracts from the basal ganglia encouraged new stereotactic surgical approaches (see Figure 1).

CONFUSION, DISENCHANTMENT, AND REBIRTH OF SURGICAL TREATMENTS

The popular use of carbidopa-levodopa (Sinemet) has led to controversy in choosing the most effective medical approach in managing PD. By combining a peripheral decarboxylase inhibitor[13] (carbidopa) with L-DOPA, higher levels of central L-DOPA can be offered patients at lower systemic doses thereby eliminating severe gastritis and cardiotoxic side effects of arrhythmia, orthostatic hypotension, and heart failure. Whereas the use of L-DOPA alone may have required daily doses of 10-20 grams, 1-2 grams of L-DOPA in the form of carbidopa-levodopa (Sinemet) are typically adequate to relieve symptoms of bradykinesia and rigidity today, but postural instability is refractory to this treatment and tremor is rarely well-controlled. Newer timed-release preparations (Sinemet CR) have extended treatment effects from 3-4 hours to 6-8 hours in many cases. Proponents of Sinemet monotherapy have noted that the duration of effective therapy runs to about 5 years because failing dopamine-secreting neurons of the basal ganglia are typically inefficient in processing L-DOPA to dopamine after the 5 year window.

Several dopamine agonists, not requiring biotransformation to an active form, have been developed initially as Sinemet extenders and more recently employed early-on with Sinemet to limit dosing requirements for the Sinemet, the so-called Sinemet-sparing agents. These have included bromocriptine (Parlodel), pergolide (Permax), and in the last 2 years, ropinerole (Requip) and pramipexole (Mirapex). Each drug exerts a different spectrum of activity at subtypes of dopamine receptors. Therefore, differing side effect profiles can be selected to replace objectionable side effects of other agonists in specific patients. Pramipexole (Mirapex) is especially useful in patients with refractory tremor and its antitremor effect impressive enough to suggest a potential use also in essential tremor (Dr. Reynolds, personal observations). Unfortunately, each agonist is quite capable of initiating confusional states and/or visual hallucinations. If psychotic signs are not relieved by lowering concomittant Sinemet doses, the agonist is either discontinued or a dopamine antagonist with minimal basal ganglia binding must be added, such as risperidone (Risperidal), clozapine (Clozaril), olanzepine (Zyprexa), or quetiapine (Seroquel) in minimal HS dosing. Failing this countermeasure, haloperidol (Haldol®) may be required for a few days along with anti-Parkinson drug maintenance limited to much lower doses.

A major area of confusion exists regarding the margin of safety for Sinemet based on the theory (from animal studies) that excessive intracellular dopamine leads to free radical production, a key pathophysiological mechanism in neuronal destruction.[14-15] The human threat of free radical mechanisms was brought to popular attention with the report of Parkinsonism being induced by a highly potent neurotoxic contaminant of street narcotics called MPTP (1-methyl-4-phenyl-4-propionoxypiperidine).[16] Sinemet treatment conservatives believe that high intracellular dopamine will cause rapid progression of PD and be self-defeating. Signs of L-DOPA failure include premature end-of-dose-failure or on-dyskinesias at the time of dosing. Solutions to this problem generally involve the reduction of peak dose effects from Sinemet by lowering the dose and adding an anticholinergic (benztropine as Cogentin or trihexyphenidyl as Artane), adding or increasing an agonist (any of the above), or by adding an enzyme inhibitor[17] to extend the half-life of centrally-secreted dopamine (e.g. selegiline or Eldepryl, a centrally active monoamine oxidase inhibitor).

Proponents of Sinemet as the primary treatment advocate the addition of enzyme inhibitors with peripheral effects to maintain higher but non-fluctuating levels of L-DOPA with minimal supplemental agonists.[18] The latter are called catechol-o-methyltransferase (COMT) inhibitors. Two examples are tolcapone (Tasmar) and entacapone (Comtan). The former has inhibitory actions but has attracted recent attention by association with hepatic failure in a few cases and the need for biweekly liver enzyme tests for continued use during the first year, every 4 weeks for the next 6 months, and 8-week intervals thereafter. Another approach to prolong central levels of secreted dopamine is the addition of supplemental carbidopa (Lodosyn) available as a courtesy by special request from the manufacturer of Sinemet (Abbott Labs). Both Requip and Mirapex are being marketed as potential monotherapy as an alternative to the "free radical risk" of high dose Sinemet or to combination drug therapy. COMT-inhibitors are being marketed to allow upward titration of Sinemet without fluctuations in motor performance.

Such multiple therapeutic controversies and dilemmas have encouraged basic and clinical scientists to experiment with transplant surgeries with or without genetic engineering, but these efforts are still suboptimal and limited to experimental trials.[19] It would be wonderful to download myriad engrams concerning multiple conflicting treatment options and replace nigral pathology with fresh fetal transplants like a prosthesis; however, this area remains speculative as a viable treatment option until the technology of central neural transplants shows long-term success. On the other hand, stereotactic lesioning and implants for deep brain stimulation are being used more frequently to address solutions to cases of medication failure or as relatively benign alternatives to tedious drug titrations and issues of side effects. Physiological and anatomic detail provided by the DeLong model[20] of the pallidal outflow tracts is the scientific basis for the renewed surgical interest (see Figure 1).

Table 4. Complications of drug therapy

- Orthostatic Hypotension
- Hallucinations/Confusional States
- On-Effect Dyskinesias
- End-of-Dose Failure

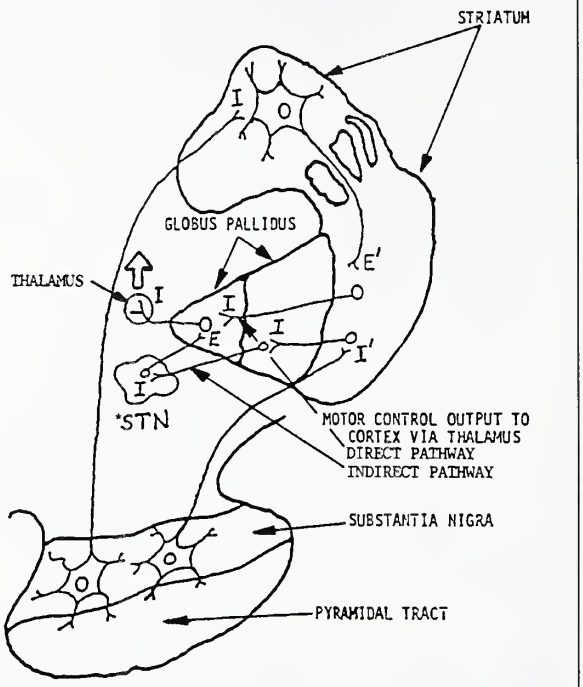
Table 5. Antipsychotic adjuvants

- Risperidone (Risperdal® 1-3 mg. HS or BID)
- Clozapine (Clozaril 12.5 mg. HS or BID)
- Olanzepine (Zyprexa 2.5-5mg. HS or BID)
- Quetiapine (Seroquel 25 mg HS or BID)

STEREOTACTIC SURGERY AND DEEP BRAIN STIMULATION

Stereotactic surgical techniques provide additional treatment modalities in movement disorder patients with dyskinesia, dystonia, tremor, and Parkinsonian signs that are refractory to medication or are difficult to treat because of objectionable systemic or neurologic side effects. The more common techniques include thalamotomy and thalamic deep brain stimulation for tremor; pallidotomy and pallidal deep brain stimulation for dystonia; and, pallidotomy and pallidal or subthalamic deep brain stimulation for Parkinsonian signs of tremor, rigidity and bradykinesia. In the Parkinson's patient with multiple movement disabilities, combinations of these techniques can be tailored and staged to address several signs when this is required. The accuracy of radiofrequency lesioning or electrode placement of a deep brain stimulator requires several modalities to insure effective clinical outcomes. High quality magnetic resonance imaging is imperative to resolve anatomic landmarks to target specific locations within nuclei using a stereotactic frame affixed to the skull with surgical screws (stereotactic guidance). Coordinates are available from anatomic brain maps, but variability in extrapyramidal circuitry makes physiological confirmation necessary using some form of intraoperative microelectrode mapping. Mapping can be either passive, to record nuclear burst patterns characteristic of specific regions of interest, or it can be active with stimulation to either augment or block the rigidity or tremor apparent with clinical monitoring. As expected, access is provided by a burr hole in an awake

Figure 1. Direct and Indirect Pathways as Defined by Mahlon DeLong, the Basis for Modern Stereotactic Lesions



*Subthalamic Nucleus

patient which allows active examination of limb response, speech, and the confirmation of any visual hallucinations experienced by the patient.

Although the conventional approach to stereotactic placement is detailed microelectrode guidance within the operative suite, this scenario limits the anatomic confirmation to pre- and post-operative brain scanning. We prefer to perform the entire procedure following craniotomy in the computerized tomography suite with the major emphasis on CT guidance. This allows rechecking of anatomic landmarks to correct for relaxation of intracerebral contents after craniotomy. In addition, CT guidance facilitates dialogue between the neurosurgeon and his operative and collaborating team members, including a neuroradiologist, clinical neurologist, and biomedical engineer, all with special expertise in conditions of the basal ganglia. Although wound closure can be accomplished in the CT suite, opening, closing, light anesthesia induction, typically propofol (Dipravan), and craniotomy are performed in the operative suite.

We prefer pallidotomy lesions in the posteroventral pallidum as medial as possible (mPVP) on the side contralateral to the most affected body side in an asymmetric patient or simply in the dominant hemisphere in symmetric patients. The medial location is juxtaposed to the pyramidal tract and requires clinical monitoring of toe signs, dexterity, and strength in addition to the patient's report of flashes of light, or observations of forearm or biceps spasm and enhanced manual tremor by active mapping. Decrease in tone and tremor should be observed in the neurologist's examination during a reversible "practice" lesion. Several radiofrequency heat lesions of larger diameter follow the "practice" one of low intensity.

Although the surgical suite itself requires sterility and conventional gowning, the CT suite is best described as clean. The CT coil housing is adapted as the traditional "ether screen" with participants on the surgical side in gloved and gowned surgical apparel (surgeons and surgical assistants) and participants on the anesthesia side (clinical neurologist, biomedical engineer, neuroradiologist, and anesthesiologist) in street apparel or surgical scrubs with surgical caps and face masks because of open containers in the suite. As expected, all participants leave the suite during irradiation and confer with each other after new scans are viewed. Post-operative protocol places the patient in the neurointensive care unit for the remainder of the first day after documentation of stable vital signs in the recovery room. One or two additional days of routine ward care follow with discharge to home on day 3 unless rehabilitation efforts are planned to improve motor performance. Pre-operative anti-Parkinson medication is either maintained or reduced slightly to avoid confusional states or ongoing dyskinesias immediately after surgery. Additional medication reduction may be possible in Movement Disorder Clinic visits over 1 to 6 months. Except for thalamotomy and patients with deep brain stimulators, several anti-Parkinson medications are typically required for post-operative maintenance of motor function. After a 6-month period of observation and medication adjustment, another procedure on the other side can be performed if desired.

Thalamotomy and deep brain stimulation of thalamic structures can be very effective for major Parkinson tremor or disabling essential tremor, refractory to betablockers, primidone, gabapentin, or pramipexole. CT-guidance procedures similar to pallidotomy are performed, but extensive micro-electrode mapping is unnecessary because of the focality of the target in the nucleus ventralis intermedius (Vim) and the accuracy of macrostimulation with the deep advancing Activa electrode toward the Vim along the anterior commissure-posterior commissure line. In both cases active electrode guidance produces tremor augmentation which will be observed as enhanced tremor or palpated as enhanced cogwheeling during passive range of motion. Undesirable transient signs of vertical nystagmus and regional limb or facial paresthesias (painful or tingling) can be elicited and avoided in terms of final placement. Reversible radiofrequency

heat lesions for thalamotomy set the coordinates for the larger permanent lesions.

Electrode placement of the Activa stimulator tip relies on CT-guidance and macrostimulation but a precise tip location ±1-3 mm is unnecessary because of precise programming of electrode arrays, amplitude, pulse width and frequency of stimulation to be decided postoperatively usually after 3 to 4 weeks. Immediately after electrode placement, several patients experience a microthalamotomy effect with partial resolution of tremor. Patients are returned to the operating room to complete subcutaneous threading of the wires to the anterior chest and the subcutaneous stimulator installation above the breast under general anesthesia. Minor complications observed occasionally in our 30 surgeries have included focal, reversible post-operative edema and mild degrees of subarachnoid blood. The combination of CT-guidance techniques, supplemented with active and passive electrophysiologic monitoring and clinical monitoring, provides a highly accurate lesioning process accomplished within 1 hour.

Of the 10 thalamic stimulator and thalamotomy patients done in our program to date, none have needed supplemental medication for tremor. Stimulator programming is done percutaneously with a Medtronic R programmer and a controller placed on the skin directly overlying the implanted stimulator battery. Typical adjustment parameters are outlined in Table 7 but the goal is to provide fine dexterity without annoying digital paresthesias. Additional fine adjustment can be made at subsequent outpatient visits. Patients with thalamic stimulators are given a hand-held magnet to turn on and off the primary stimulation setting or to switch to a lessor amplitude stimulation to eliminate nocturnal paresthesias or to prolong battery life. Another adaptation for two independent stimulator programs can be two separate treatment strategies with competitive motor syndromes. If dysarthria occurs at higher frequencies suitable in modulating tremor for purposes of improved writing, higher settings can be used for handwriting and lower settings can be used for public speaking requirements. Patients must be warned that ambient electromagnetic fields from machinery or metal detectors can turn off the stimulator inadvertently.

Although multiple treatment options present a confusing array of alternative approaches in a given patient, the options for avoiding unwanted side effects and maximizing therapeutic results have increased markedly. This is especially important in Parkinson's disease where disease progression is inevitable and alternative treatments are necessary over time whether these be strictly medical, surgical, or combinations of each.

Table 6. Neurological Complications of Lesioning

- Intracerebral Hemorrhage
- Visual Field Loss
- Hemiparesis
- Focal Post-operative Edema
- Increased Dysarthria (Bilateral mPVP)

Table 7. Technical Complications of Deep Brain Stimulation

- Paresthesias
- Breakage of Subcutaneous Leads
- Displacement of Electrodes
- Risk of Environmental On/Off Switching
- Battery Replacement

Table 8. Typical Pacemaker Settings*

Amplitude	1.5-3.0 V
Pulse Width	60-120 sec
Frequency	100-185 Hz
Electrodes	#0(-), #1(off), #3(+), Case (off)
Mag Amp	1.5-3.0 V

*Manufacturer (Activa) suggestions

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Falsely Elevated INRs in Warfarin-Treated Patients with the Lupus Anticoagulant

Michael J. Sanfelippo, MS; Jordan Sennet, MD; and Eugene J. McMahon, MD

ABSTRACT

The Lupus Anticoagulant (L.A.) is an antibody that prolongs the clotting time of in-vitro laboratory tests by binding phospholipid in the test system. Patients with the L.A. are at increased risk for development of venous and arterial thrombosis but not hemorrhage. Therefore, many patients with the L.A. are being treated with warfarin sodium to prevent reoccurrence of thrombosis. This oral anticoagulant therapy is traditionally regulated by periodic determination of the Prothrombin Time (PT). This test is usually unaffected by the L.A. However, we have recently identified a small series of patients with the L.A. in whom the PT is affected by the L.A. This interference is manifest as an artifactually increased International Normalized Ratio (INR). These patients were identified by failure to achieve significant correction of the PT with addition of an equal volume of normal plasma to the patient plasma and a Factor X level discordant with the PT INR Interference in determination of the PT by the L.A. was found to occur in 6.5% of patients identified with the L.A. by our laboratory. It is suggested that patients with this complication of anticoagulant therapy be monitored by measurement of Factor X levels rather than the PT INR. Failure to recognize this complication may result in inadequate anticoagulation and recurrent thrombosis.

METHODS

Prothrombin Time (PT) determinations were performed on an MLA 1600 automated Clot Timer, Medical Laboratory Automation, Mount Vernon, New York. Results were reported as the International Normalized Ratio (INR). Testing was performed using a recombinant thromboplastin reagent, Recombiplastin® (Hemoliance, Raritan, New Jersey).

Assay of Factor X was performed on an MLA 900C coagulation instrument (Medical Laboratory Automation, Mount Vernon, New York). A chromogenic substrate was used (Chromogenics, Oberland, Ohio).[1]

The amount of PT correction realized by addition of an equal volume of normal plasma was determined by adding 25 μl of pooled normal plasma to 25 μl of patient plasma in a test cuvette and performing a prothrombin time on the mixture. The degree of PT correction that could be expected in anticoagulated patients without the Lupus Anticoagulant (L.A.) was determined by testing the plasma from 28 patients with levels of anticoagulation ranging from INR 2.0 to 6.5. The presence of the L.A. in these specimens was ruled out by testing with the StaClot L.A. test (American Bioproducts, Parsippany, New Jersey).[2] All testing was done on citrated (3.2%) plasma.

The relationship between INR and Factor X was determined by measuring Factor X levels in two groups of patient plasmas. The first group was a series of plasmas with PT ranging from INR 1.0 to 4.97. Plasmas from patients in this group were from patients being monitored on warfarin therapy as well as patients undergoing pre-operative screening for bleeding disorders. None of these patients had a history of the L.A. In addition, those with elevated INRs were tested for correction of the elevated INR by addition of normal plasma. All patients' plasma in this group showed complete correction with the addition of normal plasma.

The second group of patients' plasma studied was plasmas from patients being treating with warfarin. Plasmas selected for study were within the therapeutic range of INR 2.0 to 3.5. Factor X levels by chromogenic assay were measured in this group to determine the therapeutic range in Factor X concentration corresponding to the therapeutic range in the INR system. None of these plasmas were from patients with a history of the L.A. In addition, all plasmas were tested for correction of the INR with the addition of pooled normal plasma. All test plasmas showed complete correction with the addition of the normal plasma.

The occurrence of L.A. interference in the Prothrombin Time determination was estimated by review of the coagulation laboratory records on patients identified with the L.A. Records for a period of 1 year were reviewed.

The clinical histories of four patients with L.A. are as follows.

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Patient A is a 66-year-old male who underwent laparotomy for an intrahepatic, omental, and pelvic hematoma in 1984. In 1985 he developed bilateral deep vein thrombosis in his legs complicated by pulmonary embolism and was begun on Coumadin. Also in 1985, he had a seizure and workup revealed elevated CSF protein and a high sedimentation rate. Anticardiolipin syndrome was diagnosed at that time. In 1996 he underwent coronary artery bypass surgery for multivessel coronary disease. In 1987, he suffered a right frontal parietal cerebral infarct demonstrated by CT scan, which manifested as confusion and agitation. In recent years, he has been treated with Imuran, Dilantin, and Coumadin. He has been relatively stable except for an episode of thrombocytopenia with a platelet count of 4000 in 1998, which has responded well to prednisone. In 1998, cardiolipin antibodies were 433.6 (0 to 23). Currently, he is on Coumadin 4 mg qd.

Patient B is a 77-year-old female who developed left sided pleuritic chest pain in 1997. Chest x-ray and CT scan showed left upper lobe infiltrates. Ventilation-perfusion lung scan revealed small defects in both lung fields suggestive of pulmonary emboli. Bilateral lower extremity venous ultrasound was negative for thrombus. A fine needle aspiration of the left lung infiltrate showed macrophages and blood. Initial INR was 1.05 and PTT 45 seconds. Cardiolipin IGG antibody was 64.7 (0 to 23). The patient was treated with Lovenox and Coumadin. Currently she is on Coumadin 3 mg qd. A recent INR was 2.54 and Factor X 32%. In February 1999, the patient was diagnosed with chronic lymphocytic leukemia. She has not had further thrombotic episodes.

Patient C is a 52-year-old female who had the sudden onset of dysarthria and mild right hemiparesis in 1998. CT scan of the head showed a possible left parietal infarct. MR scan of the head was consistent with a small infarction in the left parietal lobe. Small areas of increased signaled intensity were seen in the periventricular region likely reflecting prior ischemia. Cardiolipin IGG antibody was 531.4 (0 to 23). The patient has been treated with Coumadin, currently about 4 mg qd. Recent INR was 5.57 with Factor X 28%. Neurological abnormalities have resolved and there have been no further thrombotic episodes.

Patient D is a 67-year-old male admitted with ventricular tachycardia. He was diagnosed as having a lupus inhibitor several years earlier and was receiving sodium warfarin at the time of admission.

RESULTS

Twenty-eight plasmas from patients with varying degrees of anticoagulation (R-4R 2.0-6.5) were tested for correction with the addition of normal plasma. The INRs after addition of normal plasma were as follows:

N=28 x= 1.17
SD = 0.036
Reference Range (x ± 2 SD) = 1.1 - 1.24 INR

Table 1. INR and Factor X Level in Patients with the Lupus Anticoagulant

Patient	INR	INR with normal plasma	Factor X
A	2.70	1.30	36%
B	1.75	1.60	162%
C	3.15	1.33	28%
D	2.29	1.87	58%

Table 2. INR and Factor X Levels Achieved by Increasing Warfarin Dose in a Patient with the Lupus Anticoagulant

Date	PT (INR)	Factor X	Warfarin Dose
9/14	1.83	131%	1 mg qd
10/9	2.17	91 %	2 mg qd
10/28	2.55	67%	3 mg qd
11/09	2.81	55%	3 mg qd
1/06	3.82	3 7%	4 mg qd
1/25	4.84	31%	4 mg qd
3/2	3.76	39%	4 mg qd

All 28 plasmas were negative for the L.A. when tested with the StaClot LA®.

Factor X levels on 20 patient plasmas without the L.A. ranging from INR of 1.0 to 4.97 ranged from 140% to 17%.

Factor X levels in anticoagulated patients without the L.A. and in the INR range of 2.0-3.5 were 43% to 17%.

In a 1-year period 123 patients were identified with the L.A. Eight of those patients had evidence of interference in the PT based on the failure to completely correct the abnormal PT by the addition of an equal volume of normal plasma. Thus the occurrence of this complication in this population was approximately 6.5%.

Four patients were referred for testing because of wide swings in their INR values. Results are given in Table 1.

DISCUSSION

The L.A. is a well-recognized risk factor for thrombosis. Patients with this condition are frequently treated with warfarin to prevent recurrent thrombosis. Anticoagulation with warfarin is traditionally regulated by adjusting the dosage according to the results of periodic PT determinations. In most patients this protocol is effective. However, some patients with the L.A. may not be adequately regulated in this way.[3,4] If the patient has an inhibitor which affects the PT, and a number of patients with the L.A. do, the physician may be unable to determine if the INR represents an anticoagulant effect from the warfarin or an artifactual elevation of the INR caused by the L.A. binding phospholipid in the test system. The latter condition affords the patient no protection from thrombosis even though the INR may be in the therapeutic range.

Therefore, the clinician is faced with two problems in the treatment of L.A. patients with warfarin:

1. Does the patient have a L.A. which is affecting the PT determination and artifactually elevating the INR result?
2. If the patient does have an interfering L.A., how can the warfarin dosage be regulated?

Occasionally, the first question will be answered at the time the L.A. was diagnosed. If a PT was performed at this time and found to be abnormal, there is a suspicion of L.A. interference. If the abnormal PT failed to correct completely when the patient plasma was mixed with an equal volume of normal platelet-poor plasma, there is a high probability that one is dealing with the L.A. This can be confirmed by performing specific factor assays on each of the coagulation factors which are measured by the PT, namely II, V, VII, X.

The presence of an interfering L.A. in the patient receiving warfarin may be identified by a failure to achieve significant correction of the abnormal PT with the addition of an equal volume of normal plasma to the patient plasma. In addition, the patients will often have a level of Factor X discordant with the INR. Patient D, for example, had an INR of over 2.0, but the Factor X level was 58%. Factor X levels in warfarin anticoaguated patients without the L.A. ranged from 43% at INR 2.0 to 17% at INR 3.5. In addition, the INR of an equal volume mixture of patient D plasma and normal platelet-poor plasma was 1.87, significantly higher than the range of 1.1-1.24 seen when plasma from warfarin treated patients without the L.A. was mixed with normal plasma and retested. It should be noted that the Factor X assay is performed by a method which utilizes a synthetic substrate. This method is not phospholipid dependent and is unaffected by the L.A. The traditional assay method for Factor X is based on the correction of the prolonged PT of Factor X deficient plasma. This method is phospholipid dependent and is affected by the presence of the L.A. Factor X levels may be artifactually reduced by the presence of the L.A. if this method is used.

Patients with the L.A. interference frequently have wide swings in the INRs during warfarin therapy. These fluctuations are what brought the four reported patients to the laboratory's attention. These fluctuations can occur because of variation in reagent response or because of fluctuations in strength of the L.A.

Some thromboplastin reagents used in the performance of the PT are crude extracts of rabbit brain and/or lung tissue. This material has a relatively high concentration of phospholipid. PTs performed with such a reagent are rarely affected by the L.A. since the L.A. acts as an inhibitor by binding phospholipid, not by inhibition of any specific coagulation factor or group of factors. Newer reagents containing human tissue factor made by recombinant technology have a much lower concentration of phospholipid. Therefore, a PT performed with these reagents are more subject to interference from the L.A. A patient who is monitored by more than one laboratory using diferent reagents may exhibit wide swings in the INR due to the difference in phospholipid content of the test reagent.

Fluctuations in the INR may also be attributed to fluctuations in the strength of the L.A. This inhibitor may, for unknown reasons, increase or decrease in strength resulting in an increase or decrease in the INR.

Patients who have a L.A. which interferes with the PT should be monitored by the Factor X assay using a synthetic substrate (Chromogenic Substrate)[3] Not all patients with the L.A. will require this, only those where there is demonstrable interference with the PT determination as previously described. This complication was found to occur in approximately 6.5% of patients with the L.A. studied by our laboratory. Our laboratory uses a recombinant human tissue factor reagent. Laboratories using a crude rabbit brain or lung reagent would have a lower incidence of interference. The Factor X levels which correspond to INR of 2.0-3.5 are 43% to 17%. This range was determined by measuring Factor X levels in patients stabilely anticoagulated with warfarin who did not have the L.A. Our range compares favorably to that suggested by Moll and Ortel,[3] who reported a range of 42% to 11% for INR 2.0-3.5 using the same chromogenic assay for Factor X. Patients having Factor X level over 43% are subtherapeutic while those having a Factor X level of less than 17% are supratherapeutic.

Unfortunately, the Factor X assay with a chromogenic substrate is not as widely available as the PT. However, the test is available from all reference laboratories specializing in coagulation testing. The regulation of warfarin dosage could then be determined by performing both a PT and a Factor X. The PT could be done locally and the Factor X sent to a reference lab. A target PT would be established when the Factor X is in the therapeutic range of 43% to 17%. The patient would then be maintained at that INR, which may be above the usually recommended upper limit of 3.5. This level, however, would be proper for the particular patient. An example of the correlation of the PT and Factor X level can be seen from the studies done on patient A (Table 2). In the case of patient A, Factor X level of 37% was finally achieved at a warfarin level of 4mg qd. This gave the patient a PT of INR 3.82. The warfarin dose would then be adjusted so that the patient's INR is approximately 3.82. It is possible for the L.A. to change in strength and affect on the PT. Therefore, a Factor X every 4 to 6 PTs would be prudent.

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Hypertension in Women

Umadevi Rangarajan, MD, and Mahendr S. Kochar, MD, MS

ABSTRACT

More women than men eventually develop hypertension in the United States due to their higher numbers and longer longevity. The white coat hypertension is also more common in women. Alcohol, obesity and oral contraceptives are important causes of rise in blood pressure among women. On the other hand, hormone replacement therapy may decrease cardiovascular mortality in the postmenopausal woman. Women with left ventricular hypertrophy are at a greater risk of death than men. Fibromuscular hyperplasia and primary aldosteronism are more common as causes of secondary hypertension in women. Nonpharmacologic therapy, such as weight reduction, exercise, salt and alcohol reduction, should always be tried prior to medical treatment of hypertension and are very useful adjunctive measures in controlling hypertension. ACE inhibitors and angiotensin receptor blockers are contraindicated in pregnancy and should be avoided in women with childbearing potential. Hypertension remains a major public health problem among black women. Although the antihypertensive drug therapy seems to benefit white women the least, proportionately more of them comply with their antihypertensive therapy.

Hypertension is the most common chronic medical condition requiring visits to the physicians, as well as prescription medications, in the United States. The epidemiology, clinical course, response to treatment and ultimate outcome of essential hypertension may vary with gender. More women than men eventually develop hypertension in the US due to their higher numbers and longer longevity.[1]

DEFINITION AND EPIDEMIOLOGY

Hypertension is defined as systolic blood pressure (BP) of 140 mm of Hg or higher and or diastolic BP of 90 mm of Hg or higher. Hypertension is strongly, continuously and independently related to coronary artery disease (CAD), congestive heart failure, stroke, renal disease, retinopathy and all-cause mortality. For every 7.5-mm Hg increase in diastolic blood pressure, CAD risk increases 29% and stroke risk increases 46% for both men and women.[2] Essential hypertension is arterial hypertension of unknown cause. Women have less hypertension before menopause, possibly because of lower blood volume and viscosity from menstrual loss. Younger hypertensive women tend to have higher resting heart rate, cardiac index and pulse pressure but lower total peripheral resistance than younger hypertensive men. As in men, higher plasma insulin levels predict the subsequent development of hypertension in women. Reversible risk factors include medications, alcohol abuse, obesity and excessive dietary sodium.[3]

Table 1. NHANES II: Prevalence of Hypertension by Gender and Race for Ages 18-74.

Men		Women		All Races	
Black	White	Black	White	Men	Women
37.9	32.6	38.6	25.3	33.0	26.8

Figures are in percentage. Hypertension is defined as SBP>139 or DBP>89 mmHg, average of three readings on one occasion or on antihypertensive medication(s).

Several large studies have reported the prevalence of hypertension in the United States according to gender, race and age. Most reliable data pertain to blacks and whites. Some information is available regarding hypertension in Latinos, but no population data has been reported for Asian Americans. According to National Health and Nutrition Examination Survey II (NHANES II) among those 18 to 74 years of age, blacks have a higher prevalence of hypertension than whites; black women have the highest overall prevalence of hypertension as shown in Table 1.[4] In both races there is a higher prevalence of uncontrolled hypertension in men than in women. Based on the Hispanic Health and Nutrition Examination Survey, the Laredo Study, and the San Antonio Heart Study the prevalence of hypertension in Mexican-American men and women equaled that in whites, but in Cuban-Americans the prevalence is lower. As in whites, the prevalence in Mexican American and Cuban-American

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Table 2. Differences in Hypertension Between Men and Women

	Men	Women
Blood Pressure	Mean diastolic BP is higher in all age groups	Mean diastolic BP is lower in all age groups
Prevalence	Higher	Lower
Awareness	65% among non-Hispanic whites and blacks, 44% among Mexican Americans	75% among non-Hispanic whites and blacks, 61% Mexican Americans
Control of hypertension	19% under control	28% show control
Treatment	48% received drugs	66% received drugs
Target organ damage	Relative risk:	Relative risk:
Stroke	2.7	2.3
CV disease	1.57	1.49
CV death	1.73	2.3
Effect of treatment		
Australian trial	26% decrease in all end points	No effect at all
MRC trial	15% decrease in all cause mortality	26% increase in all cause mortality
OC Use	Not applicable	31% of young women show increase in BP. When combined with smoking cause 4 to 8-fold increase in CVsystem associated mortality.
HRT	Not applicable	Decreases mortality by 50%

women exceeds that in men after age 65.[5,6] The data from the Hypertension Detection and Follow-up Program (HDFP) show that women have a greater likelihood of knowing that they have hypertension and of taking antihypertensive medications during screening.[7] Due to a larger number of women in the overall population (51.4%), particularly in the age group in which hypertension is more common, there is a larger absolute number of women than men with hypertension.

A follow-up study of NHANES I that looked at the development of newly-detected hypertension a mean of 9.5 years after the initial screening, within each race, men and women had comparable incidence of newly detected hypertension at all ages.[8]

Twenty-year follow-up data from the Framingham study indicate that hypertensive men have a higher incidence of cardiovascular endpoints at all ages than women. Whereas, the absolute number of cardiovascular events attributable to hypertension is actually greater in women than in men by age 65 to 74 years,[9] women with moderate and severe hypertension have lower ambulatory blood pressure and less cardiac hypertrophy than men with similar clinic pressure.[10] There is more discrepancy between office and ambulatory readings with increasing age,[11] and "white coat hypertension" is more common in women.[12]

SECONDARY HYPERTENSION

Secondary hypertension is uncommon in both genders. It may be caused by a large number of diseases including renovascular disease, polycystic kidneys, Cushings syndrome, pheochromocytoma, primary aldosteronism or coarctation of the aorta. Alcohol use is also associated with increase in blood pressure and may be the most common cause of "secondary hypertension."

ORAL CONTRACEPTIVES

Development of significant levels of hypertension in OC users is 1.5 to 3 times more likely than in non-users.[13] With OC use there is an increased risk of hypertension, venous thromboembolism, stroke, and myocardial infarction.[14] Though the overall risk of cardiovascular complications is small in young healthy women, there is a 4 to 8-fold increase in mortality due to cardiovascular complications in OC user compared to non-users. These deaths primarily occur in women who smoke.[13] Women using OC show an average 5-7 mm of Hg increase in systolic blood pressure and a smaller 1-2 mm of Hg rise in diastolic blood pressure. This increase occurs more commonly in women in their mid thirties and older.[14] Among the young women using OC, up to 31% demonstrate a rise in blood pressure.[15] The time of onset of hypertension after OC use can vary from a few weeks to several years. The most common complaint is headache that is continuous and generalized. Sudden occurrence of malignant hypertension is also possible. Women with a history of hypertension during pregnancy and those with family history have a greater rise in blood pressure.[14] Duration of OC use and increase in BP go hand in hand; those who have used OC more than 1 year have the greater rise in blood pressure.[16]

OC may cause hypertension de novo or may simply uncover the propensity toward primary hypertension that would eventually appear spontaneously. Although the mechanism for OC-induced hypertension is not fully understood, it is probably related to volume expansion due to increased activity of the renin angiotensin aldosterone system. The primary factor is an increase in the hepatic synthesis of renin substrate.[16] The recent formulations of OC containing low dose estrogen, and low dose and potency progestin are considered to be safer. However the most recent evi-

dence points that all levels of progesterone and low levels of estrogen are associated with significant increase in risk for hypertension. Users of biphasic and triphasic combination pills have a smaller risk compared to monophasic combination.[17]

HORMONE REPLACEMENT THERAPY

A number of studies have demonstrated that cardiovascular mortality of postmenopausal women on hormone replacement therapy (HRT) decreases by approximately 50%.[18] Both systolic and diastolic blood pressure may decrease with estrogen administration. Concurrent use of progestin does not attenuate the benefit of estrogen.[19] The differences between OC pills and HRT are striking.[20] The lower blood pressures associated with HRT may reflect a number of antihypertensive effects including vasodilatation reflecting endothelium-dependent relaxation effects on cation fluxes that reduce intracellular calcium, improvements in baroreceptor reflex sensitivity, and reversal of the hyperinsulinemia seen after loss of ovarian function.[21-24] A Swedish study supports this evidence and presents the data that an acute but small reduction of daytime blood pressure is seen with ambulatory blood pressure recordings in hypertensive postmenopausal women using transdermal estrogen.[25]

HYPERTENSION DURING PREGNANCY

Five different forms of hypertension are observed during pregnancy: 1) chronic hypertension, 2) preeclampsia, 3) eclampsia, 4) preeclampsia superimposed on chronic hypertension, and 5) transient hypertension. The primary defect attributed to development of preeclampsia is failure of second wave of trophoblastic invasion.[26] Most long-term follow-up studies do not demonstrate an increased likelihood of developing hypertension in women who had preeclampsia, compared to those who remained normotensive during pregnancy.[27] Transient hypertension is the pattern that usually recurs in subsequent pregnancies and may be a manifestation of latent chronic hypertension.

ALCOHOL

According to several studies, alcohol intake is associated with increased blood pressure. The risk of hypertension follows a j-shaped curve, being lowest in those reporting 1-7 drinks per week. The risk increases significantly at intakes greater than 2-3 drinks/day. The percentage of women with diastolic hypertension clearly increased from abstainers (7%) to moderate drinkers (18%) to heavy drinkers (32%) and to alcoholics (37%).[28]

RENOVASCULAR DISEASE

Renovascular disease, the cause of elevated blood pressure in 0.5% of all hypertensives, is caused by atherosclerosis in two-thirds of cases with renovascular hypertension. In most renal diseases, reduced perfusion of renal tissues activates the renin angiotensin system. Hypertension has also been attributed to failure by kidney to excrete circulating vasopressor substances and to produce a vasodilator substance, production of an unidentified vasopressor substance other than renin and retention of sodium.

Fibromuscular dysplasia is more common in women less than 40 years of age.[29,30] There are four different forms of fibromuscular stenoses. Of these, medial dysplasia is seen more commonly in young women. The process often involves multiple arteries arising from the aorta. Fibromuscular dysplasia is more commonly associated with cigarette smoking, HLA-DRW6 antigen and a family history of cardiovascular disease. Oral contraceptive use and endogenously elevated sex hormone levels do not seem to be associated with this disease.[31]

ADRENAL DISEASES

Pheochromocytoma, a tumor of adrenal medullary cells, is an exceedingly rare cause of hypertension; however, it should be considered in women because it could first appear during pregnancy. Association of pheochromocytoma and pregnancy seems to be greater than by chance alone. Left unidentified, it can be associated with maternal mortality of 40% and infant mortality of 30%. Pheochromocytomas diagnosed at the first and second trimester should be resected after the usual medical preparation. Those diagnosed in the third trimester should be managed with medications initially followed by removal at the time of elective C-section.[32] Primary aldosteronism due to adrenal adenomas as well as bilateral adrenal hyperplasia is more common in women than men.

TARGET ORGAN DAMAGE

According to the 20-year follow-up data from the Framingham study, men have a higher incidence of cardiovascular endpoints than women at all ages. However, when a specific endpoint such as stroke is considered, hypertensive men and women have a comparable relative risk over time (2.3 for women and 2.7 for men).[33] Echocardiographically-proven LVH was independently associated with increased risk for all measured endpoints.[34] For cardiovascular disease, women and men with LVH have a similar increase in relative risk (1.49 in women and 1.57 in men), but for cardiovascular death and death from all causes, women with some degree of LVH had a greater increase in relative risk than men (2.12 and 2.0 in women compared to 1.73 and 1.49 in men).[35] For renal diseases utilizing serum creatinine determinations, 1 study found that both women and men with high blood

pressure levels had an increased risk of hypercreatininemia in the next 15 years.[36]

EFFECT OF TREATMENT

A review of the past major intervention trials suggests clinically significant differences in outcome, specifically cardiovascular endpoints in black and white men and women who are treated for hypertension. A subset analysis of the HDFP data showed that the black women had a significant decrease in all cause mortality, whereas white women showed no benefit in the more intensively treated patients.[7]

In the Australian Therapeutic trial in mild hypertension subjects, men had a significant 26% decrease in all end points whereas after control for other cardiac risk factors, women showed no treatment benefit.[37] The Medical Research Council trial compared therapy with placebo and observed a 15% lower all cause mortality rates in men but 26% higher rates in women.[38] These findings call for more long-term studies on treatment of hypertension in women.

Considering the above data, the treatment of young and middle-aged hypertensive women should be conservative. For white women in the low risk group, drugs should be prescribed only after a focused trial of lifestyle modifications. An expert committee from New Zealand proposes the institution of drug therapy only if the 10-year risk for CHD is 20% or higher based on Framingham study. This would correlate to a Systolic BP >= 170 mm of Hg and diastolic BP >= 100 mm of Hg, in the absence of any other risk factor.[39] The current recommendation in the United States is to treat BP >140/90 mmHg in everyone.[40]

NON-PHARMACOLOGIC THERAPY

Weight reduction consistently reduces BP. Since obesity is more common in middle aged women than middle aged men in the United States, and the benefits of antihypertensive therapy are less well defined among white women, especially those under age 60, weight reduction is a particularly important approach to reducing hypertensive complications in women.[41-45]

Physical activity has well-documented benefits in women in reducing risk of osteoporosis,[46-47] decreasing rates of diabetes, improving weight control, decreasing stress and decreasing overall mortality. This may include a 30-minute aerobic exercise program at least 3 times a week and should be initiated gradually. Middle-aged hypertensive women engaged in a 4-month exercise training program demonstrated a significant fall in BP and increase in the peak oxygen uptake.[48] Exercise as a non-pharmacological tool for the treatment of hypertension is highly justified.

Salt intake has been observed to cause alterations in blood pressure in both normotensive and hypertensive persons. Weinberger et al noted that plasma renin activity was significantly lower in sodium sensitive individuals than in those who were sodium resistant.[49] Data from the Trial of Antihypertensive Intervention and Management study also indicate interplay between plasma renin levels and diastolic BP response to non-pharmacological therapy. Hypertensive women have been observed to have lower renin levels than hypertensive men, hence the possible difference in the antihypertensive efficacy of sodium restriction should be further explored. Serum ionized calcium and magnesium vary in opposite directions with plasma renin activity. Since plasma renin activity varies with gender, consideration in discriminating groups to benefit from particular dietary advice needs specific investigation. The Ranch Bernardo 12-year cohort study suggests a 4.8 fold increase in stroke associated mortality rate in women in the lowest tertile of potassium intake when compared with those in the top 2 tertiles,[50] indicating that increased consumption of fruits and vegetables might protect against the ride effects from oral contraceptives.

Alcohol consumption and its relationship to blood pressure among women was evaluated in a study from Finland as stated earlier. Moderately elevated diastolic pressure in combination with normal systolic BP could be a possible sign of alcohol abuse in women, and abstinence should be emphasized as an effective treatment for them.[28]

PHARMACOTHERAPY

After a trial of lifestyle measures such as weight, alcohol and salt reduction, along with exercise, single drug therapy should be the first choice to improve patient compliance, reduce side effects and decrease cost.

Diuretics reduce BP by decreasing plasma volume and vasodilatation. They are the preferred choice for blacks, OC induced hypertension and thin white women at risk for osteoporosis. They may raise serum cholesterol, uric acid and lithium levels in blood and may cause hypokalemia. They are contraindicated in patients with allergy to sulfonamides. Loop diuretics are well known to cause electrolyte disturbances. Potassium-sparing diuretics are very useful but should be used with caution in patients using angiotensin converting enzyme inhibitors (ACEI) and those with chronic renal insufficiency. They should also be avoided in pregnancy.

Beta-Blockers reduce BP by decreasing the heart rate and cardiac output. They also decrease renin release and neutralize reflex tachycardia caused by vasodilators. They are particularly useful in younger white patients, and in those with angina, previous MI, or migraine headaches. Side effects are asthma, increase in triglyceride levels, bradycardia, atrioventricular conduction

defects, Raynaud's phenomenon, nasal congestion and CNS symptoms with nightmare, excitement and confusion. They should be avoided in the first trimester and used with caution later in pregnancy. They are contraindicated in patients with asthma, greater than first-degree heart block and bradycardia, and relatively contraindicated in type I diabetes.

Angiotensin Converting Enzyme Inhibitors suppress the renin angiotensin aldosterone system, inhibit bradykinin degradation, stimulate vasodilating prostaglandin synthesis and at times reduce sympathetic nervous system activity. They are specifically useful in CHF, and in patients with type II diabetes and renal dysfunction. They should be avoided in pregnancy due to adverse effect on the fetal growth. The adverse effects are cough, angioedema, hypotension, rash and hyperkalemia. A prospective, randomized, doubleblind controlled study compared an ACEI with a diuretic and concluded that ACEI were better tolerated in post menopausal women and did not affect certain metabolic parameters.[51]

Angiotensin Receptor Blockers act by inhibiting the renin angiotensin system at the level of end organ. They are generally free of the ACEI's side effects such as cough, skin rash and angioneurotic edema but are contraindicated in pregnancy.

Calcium Channel Blockers reduce BP by causing smooth muscle relaxation and peripheral vasodilation. They are a good choice in patients with associated angina and asthma. Common side effects are hypotension, peripheral edema, headache and constipation.

Alpha-adrenoreceptor antagonists reduce BP by blocking postsynaptic alpha-receptors, relaxing smooth muscle and by lowering peripheral vascular resistance. They decrease total cholesterol and increase HDL levels in blood. Major side effects are hypotension and syncope.

Central Sympatholytics reduce BP by stimulating central alpha-receptors that inhibit efferent sympathetic outflow. Clonidine is available in patches that are replaced every week. Methyldopa is a drug of choice in pregnancy. The side effects include sedation, fatigue, dry mouth and postural hypotension.

Vasodilators cause direct smooth muscle relaxation and peripheral vasodilatation. Hydralazine can be used in pregnancy. Side effects are reflex tachycardia, increased myocardial contractility, headache, palpitations and fluid retention.

Peripheral Sympathetic Inhibitors: Guanethedine and reserpine deplete tissue stores of catecholamines and inhibit catecholamine release from neuronal storage sites. They are now used chiefly in refractory hypertension. They can cause serious exercise-induced and orthostatic hypotension.

CONCLUSION

The goal of hypertension detection and treatment is to prevent the mortality and morbidity associated with it. Available data suggest that gender may influence the natural course of hypertension. Amongst the subgroups in gender, black women should be screened and treated as they show benefits with treatment. For white women, caution should be employed before instituting drug therapy. Periodic evaluation for target organ damage should be done. Intervals between the office visits can be individualized depending on the degree and lability of the disease. It should be emphasized to the patient that hypertension is a chronic disease that can only be controlled and not cured.

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Public Health Strategies to Reduce and Prevent Alcohol-Related Illness, Injury and Death in Wisconsin and Milwaukee County

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ABSTRACT

This paper illustrates the application of a Public Health Model toward understanding the nature and extent of alcohol-related problems and, in turn, provides examples of strategies targeted at reducing or preventing alcohol-related illness, injury and death in Wisconsin and Milwaukee County. More specifically, data are provided detailing the widespread use and misuse of alcohol as well as the medical, behavioral and social problems associated with its use. Alcohol use and misuse is the third leading cause of preventable death behind only tobacco use and diet/activity patterns, and therefore, warrants the implementation of prevention strategies from a public health perspective. In sum, the public health model specifies three interrelated factors – the host, the agent or vehicle, and the environment - that focus strategies to reduce and/or prevent illness, injury and death. The paper concludes with specific examples of alcohol-related public health strategies targeting the host (e.g., youth and families, minority groups), the agent/vehicle (e.g., alcohol content, labeling of containers, large containers), and the environment (e.g., motor vehicle operation BAC limits, zero tolerance laws, alcohol advertising).

AIMS OF THIS REPORT

The primary aim of this paper is to illustrate the application of a Public Health Model toward understanding the nature and extent of alcohol-related problems and, in turn, to provide examples of strategies targeted at reducing or preventing alcohol-related illness, injury and death in Wisconsin and Milwaukee County. However, in the interest of space, it is the beyond the focus of this paper to provide "cookbook" guidelines for implementing alcohol-related public health strategies in local communities. It is the responsibility of researchers and prevention planners to collaborate in specifying tenable public health strategies that address desirable alcohol-related public policy goals and objectives.

In sum, this paper begins with a characterization of the impact of alcohol use and misuse, provides some general framework for characterizing alcohol-related problems and then details the alcohol-related illness, injury and death and economic costs of this public health problem. Then, a model for addressing issues associated with alcohol use and misuse from a public health perspective are discussed. More specifically, the Public Health Model specifies *agent/vehicle* (i.e., alcohol, containers), *host* (i.e., the person who uses alcohol) and *environment* (e.g., pricing/taxation, availability, promotion) characteristics of alcohol's impact on public health. Finally, potential public health-focused strategies are provided for reducing or preventing alcohol-related illness, injury and death specifically targeted for Wisconsin and Milwaukee County.

IMPACT OF ALCOHOL USE AND MISUSE

Overview

Alcohol is the most widely used psychoactive drug in the United States today.[1] Alcohol misuse is the third leading cause of death, behind only heart disease and cancer, and the third leading cause of *preventable* death, behind only tobacco and diet/activity patterns.[2,3] Use and misuse of alcohol results in premature death to a much greater degree than both heart disease and cancer, shortening life by up to 37 years.[4] Alcohol-related morbidity, with its medical and social effects and related costs, overwhelms individuals, families and health and social systems at the national, state and local levels.

Every year, over 4 million Americans become new drinkers (81,081 of those being Wisconsin residents of which 14,736 are Milwaukee County residents), making alcohol the leading drug of choice ahead of cigarettes, marijuana and other illicit drugs.[5] Table 1 provides a summary of the new users per year of a variety of substances in Wisconsin and Milwaukee County. Unfortunately, many of these new users of alcohol are under the legal drinking age and underage drinking has been shown to be a strong predictor of an

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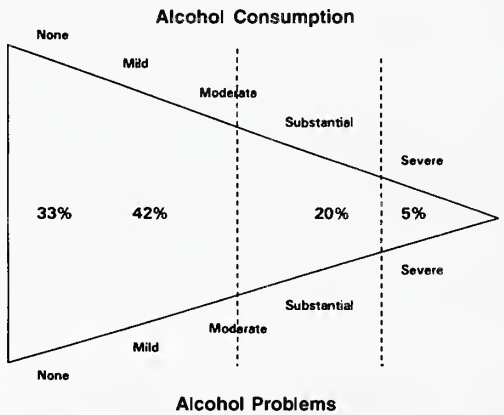
Table 1. Estimated Number of New Substance Users per Year in Wisconsin and Milwaukee County

Substance	New Users Per Year	
	Wisconsin	Milwaukee County
Alcohol	81,081	14,736
Cigarettes	58,598	10,650
Marijuana	43,895	7,978
Hallucinogens	17,784	3,232
Inhalants	12,987	2,360
Cocaine	10,394	1,889
Heroin	2,379	432

Note: Estimated from the National Clearinghouse for Alcohol And Drug Information, 2/19/98, New Substance Use Dynatable. http://www.health.org/dynatable/ndu.asp? Derived from SAMHSA Household Survey, Advance Report Number 18, August, 1996.

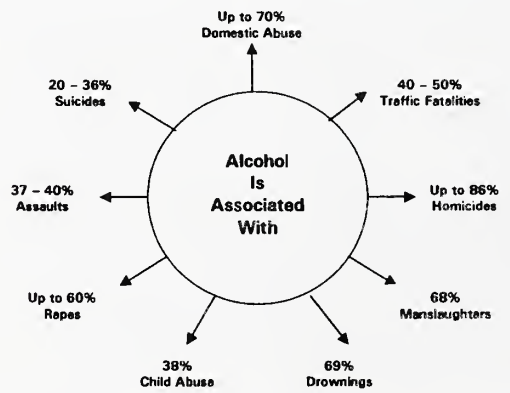
Figure 1. Continuum of Alcohol Consumption and Problems and Associated Prevention and Intervention Services Required for Abuse and Dependence Disorders



Services Continuum:	Primary Prevention (Broad-Based)	Secondary Prevention (Brief Intervention)	Intervention (Specialized Services)

Adapted from the Institute of Medicine (1990). Broadening the Base of Treatment for Alcoholism. National Academy Press: Washington, DC.

Figure 2. Various Behavioral and Social Consequences Associated with Alcohol Misuse



Source: Adapted from Tinzman & Hixson (1992). Additional data from Collins & Messerschmidt, 1993; NIAAA Special Report to Congress on Alcohol and Health, 1993; 1997; Hayward, 1992; Roizen, 1997.

alcohol disorder later in life.[6] In addition, alcohol is a common "gateway" drug, leading to the use of other illegal substances.[7]

Given that Wisconsin in general and Milwaukee County in particular have a strong historic tradition in the manufacturing and distribution of alcoholic beverages, particularly beer, it is not surprising that excessive alcohol consumption exacts even a larger-than-usual burden on the state's residents. For example, only 30% of Wisconsin residents over age 12 abstain from alcohol — lowest of any state in the union. Other notable Wisconsin and Milwaukee County statistics related to alcohol use and misuse include:

- In Wisconsin there are 222 new users of alcohol every day; in Milwaukee County there are about 40 new users of alcohol every day.[5]
- From 1970 to 1990 Wisconsin, compared to other states, ranked fourth highest in the nation in per capita beer consumption, seventh highest in distilled spirits consumption and 26th highest in wine consumption.[4]
- In 1995 70% of Wisconsin residents were drinkers.[4] Of these 5% (256,144) were classified as chronic drinkers (60 or more drinks per month). About 6% (58,176) of Milwaukee County residents are chronic drinkers.[8]
- About 16% (768,431) of Wisconsin residents engage in binge (≥5 drinks on any one occasion in the past month) drinking, translating to about 139,687 Milwaukee County residents who engage in binge drinking.[9]
- Wisconsin ranks first among states in the number of liquor licenses issued annually. There were about 16,700 liquor licenses granted in Wisconsin in 1996, with about one for every 308 men, women and children in Wisconsin, and one for every 412 people in Milwaukee County.[10-12]
- Annually, in Wisconsin, the alcohol industry generates $7 billion in business, $40 million in taxes, and 130,000 jobs.[13]
- Alcohol-related morbidity and mortality cost over $3 billion annually, ranking Wisconsin fifth nationally at $611 for every Wisconsin resident.[13]

Current Definitions of Alcohol Use and Related Disorders

Consuming alcohol is part of many social and celebratory events. Some studies have suggested that alcohol can even be beneficial to one's health when consumed at low levels.[14,15] Not everyone consumes alcohol and many individuals use alcohol responsibly and sensibly. Others, however, use alcohol excessively or in high-risk situations, and still others drink chronically or are dependent on alcohol.

For example, as shown in Figure 1, the Institute of Medicine estimates the largest proportion of individuals

(about 75%) either abstain (33%) or drink light-to-moderate amounts (42%), with about 20% consuming substantial amounts of alcohol, and about 5% drinking heavily.[16] Furthermore, for those who drink, there is a corresponding increased degree and severity of alcohol-related problems occurring with increased amounts of consumption.

Historically the term "alcoholism," or referring to people as "alcoholics," reflected the general perception that having an alcohol problem was an all-or-nothing, unitary disorder requiring specialized, abstinence-based interventions. However, more recently, alcohol disorders have been seen as reflecting a range of use and related consequences, problems and syndromes. Figure 1 also displays a corresponding continuum of services that should be considered ranging from primary prevention to secondary prevention to specialized intervention services.

The National Institute on Alcohol Abuse and Alcoholism provides physician guidelines for categorizing levels of alcohol consumption,[17] whereas the American Psychiatric Association provides diagnostic guidelines for alcohol disorders.[18] Taken together, alcohol consumption and problems categorization includes a range of patterns including low-risk drinking, at-risk drinking, alcohol abuse (such as binge or heavy episodic drinking, hazardous or non-responsible drinking) and alcohol dependence or alcoholism. Typically, these alcohol classifications are determined by a combination of alcohol consumption and alcohol-related problems criteria to determine an individual's status.[19,20] Recently, researchers have reviewed the literature on alcohol consumption classification strategies and have recommended a clinically- and empirically-based classification.[21,22]

Alcohol-Related Illness, Injury and Death

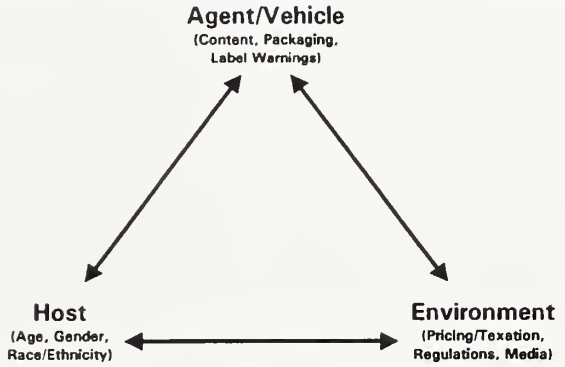
There are over 100,000 alcohol-related deaths annually, making it the third leading cause of death behind heart disease and cancer, and the third leading cause of preventable death behind only tobacco and diet/activity patterns.[2,3] Excessive alcohol use robs individuals of valuable years of life, causing premature death to a much greater degree than both heart disease and cancer.[1,4] Regular, heavy consumption of alcohol can result in undesirable health problems for most individuals. Even low-to-moderate consumption of alcohol can be desirable or undesirable depending on the characteristics and health status of the individual consuming the alcohol.[4,14,15,23,24] The health and social consequences of excessive alcohol consumption includes personal illness, altered role functioning (with family, friendships and work), and intentional and unintentional deaths and injuries. Figure 2 graphically summarizes the percentages of individuals affected by behavioral and social consequences of excessive alcohol use.[25]

Table 2. Direct and Indirect (Illness or Injury) Deaths Attributed to Alcohol Consumption

Direct Alcohol Deaths	
Alcohol psychoses	Alcohol dependence syndrome
Alcohol polyneuropathy	Non-dependent abuse of alcohol
Alcohol cardiomyopathy	Alcohol gastritis
Alcoholic fatty liver	Acute alcoholic hepatitis
Alcoholic cirrhosis of liver	
Alcoholic liver damage (unspecified)	
Excessive blood level of alcohol	
Accidental poisoning by ethyl alcohol (not elsewhere specified)	
Indirect Alcohol Deaths – Illness	
Malignant tumors	Diabetes
Pneumonia	Cirrhosis
Pancreatitis	
Indirect Alcohol Deaths – Injury	
Traffic fatalities	Homicide/violence Suicide
Other accident fatalities (falls, fires)	

Source: Join Together (1995). A community substance abuse indicators handbook. Boston, MA: Boston University School of Public Health and Institute for Health Policy, Heller School, Brandeis University; Doyle, R. (1996). Deaths due to alcohol. Scientific American (December).

Figure 3. The Public Health Model Depicting the Interrelationship fo the Host, Agent/Vehicle, and Environment Characteristics in Preventing or Reducing Alcohol Problems



Source: Center for Substance Abuse Prevention (1993). Prevention Primer: an encyclopedia of alcohol, tobacco and otehr drug prevention terms. The environmental approach to prevention. The California Prevention Network Journal, 3(Spring), 42-46.

In terms of alcohol-related illness, the biological effects of alcohol use are so diverse that few biological systems (digestive, endocrine, neurological, cardiovascular/respiratory, immune, skeletal) or organs (liver, pancreas) are unaffected by excessive or chronic alcohol use.[26] The deleterious effects of alcohol use can arise from both short- and long-term use, and they range from cognitive impairment to lesser-known consequences (such as malnutrition and alcohol-drug interactions) to alcohol liver cirrhosis.

In Wisconsin about 30% of all people (about 24% under age 65 and fully 78% 65 or older) reported at least one chronic health condition (such as arthritis,

Table 3. Dimensions of Host, Agent/Vehicle and Environment in Preventing Alcohol Problems.

Host	Agent/Vehicle	Environment
Intensity and duration of ingestion of alcohol (per episode and across the lifespan) Episodic or daily drinking pattern Body size (height, weight) Gender (women vs. men) Age and developmental level (Youth, Elderly) Member of vulnerable group (Ethnic minority, young males, college student) Cormorbid physical or psychiatric problems Real and perceived risk (experience, history, high risk situations, contraindications of use, etc.)	Energy and intoxicating effects Highly addictive Percent ethanol carried by beverage Type of alcoholic beverage (e.g., beer, wine, liquor) Packaging of beverage (e.g., wide mouth cans, small breakage bottles, number of ounces) Warning labels	Access and availability (formal and informal) Pricing and taxation Regulations and laws Community and societal attitudes Media advertising Program funding

Source: Center for Substance Abuse Prevention (1993). Prevention Primer: An encyclopedia of alcohol, tobacco and other drug prevention terms. Department of Health and Human Services: Rockville, M.D.; Mosher, J. F. (1990). The environmental approach to prevention. The California Prevention Network Journal, 3(Spring), 42-46.; Burke, R., and the Milwaukee Academy of Medicine, Public Health Committee (1996). Public health strategies to reduce and control tobacco-related illness, injury and death in Milwaukee County. Milwaukee Academy of Medicine: Milwaukee, WI.; Pratt, L., and the Milwaukee Academy of Medicine, Public Health Committee (1995). Public health strategies to reduce and control firearm-related illness, injury and death in Milwaukee County. Milwaukee Academy of Medicine: Milwaukee, WI. Department of Alcohol and Drug Problems, Wisconsin Clearinghouse, Undated. Framework for Preventing Alcohol and Drug Problems. Wisconsin Clearinghouse: Madison, WI.

high blood pressure, heart disease, cancer or stroke), some of which are associated with or aggravated by alcohol use and misuse.[8] In Milwaukee County a slightly higher percentage, about 31 percent of all people (about 26% under age 65 and fully 77% 65 or older), reported at least one chronic health condition, again, some of which are associated with or aggravated by alcohol use and misuse.[8]

With respect to alcohol-related deaths, Table 2 categorizes deaths due to alcohol into 12 *direct causes* (such as cirrhosis of the liver, dependence syndrome, alcohol abuse and excessive blood level of alcohol), 5 common *indirect causes due to disease* (such as tuberculosis, cancer of the throat or oral cavity and diabetes), and 4 common *indirect causes due to injury* (such as motor vehicle crashes, falls, homicides and suicides).[27,28]

Each year, alcohol contributes to about 35 deaths for every 100,000 people in the United States.[27] These estimates translate into approximately 100,000 US citizens dying from alcohol annually, with about 1800 Wisconsin and 325 Milwaukee County alcohol-related deaths per year.[27]

These 35 deaths per 100,000 can be categorized into about seven deaths per 100,000 due directly to alcohol, 10 indirect alcohol deaths per 100,000 due to disease and 18 indirect alcohol deaths per 100,000 due to injury.[27] In Milwaukee County, for example, there are about 65 direct, 95 indirect deaths due to disease and about 165 indirect deaths are due to injury. Of the 165 deaths due to injury indirectly caused by alcohol, about 92 (56%) are accidents, mostly drunk driving, 43(25%) are homicides, and 31 (19%) are suicides.[28]

Alcohol-Related Costs and Economic Problems

The ways in which the financial costs of alcohol abuse and alcoholism are characterized varies depending on the components of the costs provided in the estimates. For example, in 1990 the total cost of alcohol abuse in the United States, estimated at $98.6 billion, was greater than the costs for both tobacco abuse ($72 billion) and other drug abuse ($66.9 billion).[29] Although actual figures are not yet available, recent estimates projected the costs of alcohol abuse in 1995 to be about $125 billion.[30] Further, recent estimates suggest that both *direct and indirect* costs associated with alcohol-related traffic crashes alone costs the United States about $148 billion annually, representing $1.09 in costs for each drink consumed.[31]

For example, the Center for Substance Abuse Prevention estimates the costs for a number of different health and social effects of alcohol and drug abuse:[1,29]

- $250,000 for each liver transplant.
- $30,000 per year for neonatal care for each child affected by Fetal Alcohol Syndrome.
- $63,000 over first 5 years of a drug-affected baby's life.
- $15,496 per year for each prison inmate convicted of a drug-related crime.

For Wisconsin, on the benefit side of the cost-benefit equation, the alcohol industry is tremendously important to the state's economy.[10-12] For example:

- The Tavern League of Wisconsin estimates the total economic contribution of the alcohol industry at $7.1 billion, providing over 130,000 jobs and rivalling agriculture and tourism as the state's top industry.
- Wisconsin ranks first among states in the per capita number of liquor licenses with about one liquor license for every 305 Wisconsin residents.[17,56,122]
- Miller Brewing Company (the second largest brewery behind Anheuser-Busch) and other Wisconsin

breweries produced 12.6 million barrels of beer in 1995.
- Wisconsin consumers spent about $1.3 billion dollars on beer alone in 1995.
- Miller Brewing Company alone employs 1200 Wisconsin residents, translating into about $158 million in payroll and nearly $45 million in state and local taxes annually.

On the other side of the cost-benefit equation is how costly alcohol consumption is to Wisconsin and its tax-paying residents.[13] For example, in terms of money spent on alcohol and the economic toll of alcohol problems on Wisconsin residents:
- Alcohol problems cost the state $3 billion each year for prevention and treatment, amounting to about $611 per Wisconsin resident, ranking the state fifth nationally.
- Alcohol-related crashes cost Wisconsin about $489 million in 1995, about 18% of the total economic loss due to automobile crashes.

The heavy cost burden on Wisconsin residents for alcohol-related problems is not alleviated by current Wisconsin excise taxes on alcoholic beverages. In fact, the state of Wisconsin ranks 40th out of the 50 states in total taxes collected on alcohol sold.

A PUBLIC HEALTH MODEL FOR REDUCING OR PREVENTING ALCOHOL-RELATED ILLNESS, INJURY AND DEATH

Similar to other medical or behavioral disorders, the misuse of alcohol warrants a public health approach to identify and categorize strategies for reducing or preventing problems.[33-36] As displayed in Figure 3, the public health model specifies three interrelated factors (i.e., the host, the agent or vehicle, the environment) that identify and focus strategies to reduce and/or prevent illness, injury and death due to alcohol misuse.

Table 3 lists in detail the variety of characteristics of the host, agent/vehicle and environment factors that could be targeted for alcohol prevention and control efforts.[34-39] Briefly, the *host* refers to the person who consumes the alcohol and the characteristics of that person, such as demographics (age, sex, race, education), experiential and maturational factors (family history of alcohol use, personal experiences with alcohol) and co-existing physical and psychological health factors (diabetes, depression, anxiety, etc.). Also included in the definition of the host are those environments influenced directly or indirectly by the host's use of the agent (such as school or work environments). The *agent* refers to the alcohol itself and corresponding characteristics (such as ethanol content, amount ingested, addictive substance and its toxic effects on the physiological and psychological functioning), whereas the *vehicle* refers to the type of beverage (such as beer, wine or spirits), the container, and the route of substance administration. The public health *environment* of alcohol use refers to the factors in the social and physical context that might serve as enablers or inhibitors to alcohol use and misuse. These factors would include social acceptance of alcohol use, ease of distribution, access and availability of alcohol with respect to price and taxation, alcohol advertising in the media and laws and activist group influences).

Table 4. Risk Factors for Developing Alcohol (and Other Drug) Problems

Sociodemographic Male Inner city or rural residence combined with low socio-economic status; lack of employment opportunities	**Psychiatric** Depression Anxiety Low self-esteem Low tolerance for stress Other mental health disorders (e.g., learning disabilities) Feelings of desperation Feelings of loss of control over one's life Feelings of resentment
Family Use of drugs and alcohol by parents, siblings, spouse Family dysfunction (e.g., inconsistent discipline, poor parenting skills, lack of positive family rituals and routine) Family trauma (e.g., death, divorce)	**Behavioral** Use of other substances Aggressive behavior in childhood Conduct disorder; antisocial personality disorder Avoidance of responsibilities Impulsivity and risk-taking Alienation and rebelliousness; reckless behavior School-based academic or behavioral problems; school drop-out Involvement with criminal justice system or illegal activities Poor interpersonal relationships
Social Alcohol- and drug-using peers Social or cultural norms approving use Expectations about positive effects of drugs and alcohol Availability of or accessibility to alcohol and drugs	
Genetic Inherited predisposition to alcohol or drug dependence Deficits in neurotransmitters (e.g., serotonin) Absence of aldehyde dehydrogenase (flushing or palpitations occur when alcohol is ingested)	

Source: Adapted from Sullivan, E., & Fleming, M. (1997). A guide to substance abuse services for primary care clinicians: Treatment Improvement Protocol (TIP) Series. U.S. Department of Health and Human Services, Center for Substance Abuse Treatment: Rockville, MD.

Host-Focused Strategies

Prevention strategies that are aimed at individuals or the specific environments in which certain types of individuals function are varied. They range from large, school-based programs targeted to youth to prevent the initiation of alcohol use to smaller, secondary prevention strategies implemented in formal and informal health and social settings.[1,4,31,36] They also differ in how

Table 5. Potential Host, Agent/Vehicle and Environment Alcohol-Related Public Health Strategies for Wisconsin and Milwaukee County

Host-Focused Public Health Strategies

- Prevention planning might be targeted specifically toward youth and their families with direct input from youth in the development of age-appropriate program content and approaches.
- Primary and secondary prevention services might be directed at women's special health concerns and needs including perinatal care and health education, domestic violence counseling/crisis intervention, and screening and identifying alcohol use by women and their significant other.
- Because of the relatively high proportionate concentration of ethnic minorities in Wisconsin and Milwaukee County, particularly Native American, African American and Hispanic American populations, efforts might be directed proportionately to these groups. Primary prevention strategies could focus on creating positive, low-or-no-cost alternatives to alcohol and other drug involvement for rural youth or minority, inner-city youth and secondary strategies could be directed at screening and identifying alcohol-related problems for minority and inner-city youth and adults.
- Based on evidence for the effective use of secondary prevention screening and brief intervention in medical and behavioral health settings, research examining the effectiveness of screening and brief intervention in other health, education and social settings might be initiated, including emergency rooms, perinatal clinics, community clinics, high school and college/university counseling centers, employee assistance programs, faith/religious institutions and informal recreation settings.

Agent/Vehicle-Focused Public Health Strategies

- Requirements might be enforced to have alcohol content clearly labeled on containers and studies might be conducted on the effects of stopping the promotion of lower-cost, high-ethanol content beers and wines to certain populations.
- Support could be marshaled for State of Wisconsin Assembly Bill 115 that restricts the selling and distribution of larger alcohol container size beverages, such as the 40-ounce malt liquor beer, along with evaluating the effects of implementing this bill in Milwaukee's inner city.
- Alternative alcohol packaging materials, such as glass beer bottles that shatter into small fine-grained pieces to reduce the harm of being cut by broken glass could be promoted by prevention groups.

Environment-Focused Public Health Strategies

- Based on overwhelming empirical evidence, the state of Wisconsin might consider policy to reduce the allowable vehicular operating BAC level from 0.10 to 0.08.
- Consistent with 37 states and the District of Columbia, the state of Wisconsin might consider Zero Tolerance legislation for underage drivers. The zero tolerance BAC level might be set at .02 (to provide some margin for false positive readings) for drivers under the age of 21; at present Wisconsin has zero tolerance for drivers 19 and under.
- As an alternative to increased state and local excise taxes on alcoholic beverages, legislators might consider adopting an initiative to promote a "Nickel a Drink" legislation which would earmark funds collected to support specific health and social prevention and intervention programs. A further plan might have municipalities collect and administer these funds locally.
- The direct effects of the recent change in statewide liquor license fee from $500 to $10,000 on the number of liquor outlets in Milwaukee County could be examined. In addition, the indirect effects of this licensure fee on chronic and excessive alcohol consumption prevalence might be determined.
- Consistent with both the cities of Baltimore and Chicago, all billboard alcohol advertising might be banned in Milwaukee County residential neighborhoods.
- Local television stations could restrict alcohol commercial advertising during prime time hours and ban cartoon characters in alcohol ads that appeal to children.
- Efforts could be made to standardize the collection of epidemiological data on the incidence, prevalence and effects of moderate and excessive alcohol consumption in Wisconsin and Milwaukee County. For comparison purposes, data collection could be consistent with nationwide data collection procedures.

they conceptually approach the problems related to alcohol use and misuse. Historically, prevention research has focused more on reducing or eliminating the risk or adverse factors facing today's youth. Alternatively, more recent research is focusing on compensating for these risk factors through resiliency-enhancing, protective strategies that increase the skills and knowledge for thwarting and protecting youth from developing alcohol problems.

The host population is determined differently depending on the type of prevention or control strategy used.[8,9,40] For Milwaukee County, for example, the host for preventing the use and misuse of alcohol would be the 931,242 residents of Milwaukee County. For strategies to control the misuse of alcohol, the host would be the 651,869 residents who consume alcohol. Finally, the host for targeting strategies for the reduction of alcohol use and misuse would be the estimated 139,687 binge drinkers, of whom about 46,562 to 58,176 are heavy or chronic users of alcohol (depending on different definitions from different data sources).

Age, gender, race or ethnicity, and education are four primary demographic characteristics to be considered in targeting prevention strategies to the host. Based on current Milwaukee County census estimates, for example, approximately 250,000 youth would benefit from primary prevention efforts as well as 129,443 persons over age 65. About 500,000 women and 300,000 minority residents would benefit from specialized prevention services targeted specifically to these special populations.[40,41]

Table 4 summarizes a number of risk factors for alcohol (and other drug) misuse, broadly classified into demographic, family, social, genetic, psychiatric and behavioral categories.[42] Presence of these factors does not necessarily mean alcohol problems will develop nor does absence of these factors mean an individual will not develop problems.

Agent/Vehicle-Focused Strategies

Prevention and control strategies addressing the agent/vehicle characteristics of alcohol use and misuse include controlling the ethanol content of alcoholic beverages, manufacturing safer alcoholic beverage containers and putting alcohol warning efforts on labels and in media advertisements. Strategies may be consumption-focused (such as reducing the percent ethanol content) or alcohol-related problem-focused (such as reducing injuries by using special glass that breaks into fine pieces rather than sharp edges).[1,4,36,43,44]

Environment-Focused Strategies

Environmental strategies for reducing alcohol-related problems include economic disincentives (e.g., taxation and pricing); political legislation and regulations (e.g., advertising controls, OWI laws, legal drinking age limits and limiting the number of alcohol outlets, drinking and driving programs, server-training and liability laws); formal and informal community attitudes and behaviors related to alcohol access and availability; and program funding practices.[1,4,31,36]

PUBLIC HEALTH STRATEGIES FOR PREVENTING OR REDUCING ALCOHOL-RELATED PROBLEMS IN WISCONSIN AND MILWAUKEE COUNTY

Toward a Continuum of Prevention and Intervention Health Services

Consistent with the recent broadening characterization of alcohol use disorders, there should be a corresponding conceptual shift regarding the provision of health services for alcohol misuse. Greater emphasis should be placed on: 1) "alcohol-related problems" rather than on "alcoholism;" 2) the larger numbers of individuals experiencing diverse health consequences of alcohol misuse such as trauma resulting from binge drinking rather than merely on the chronic health problems from longer-term drinking; and 3) alcohol control policy as a prevention strategy targeted at larger numbers of people rather than on intervention with the chronic alcoholic.[32,33] Please refer to Figure 1 for the Institute of Medicine's population estimates of drinking and related problems. Consistent with these population estimates, a continuum of prevention and intervention health services should be considered ranging from: 1) primary (broad-based) prevention services for those who do not use alcohol or use alcohol non-problematically; 2) to secondary or brief interventions for those with moderate alcohol use or alcohol-related problems; 3) to specialized intervention services for individuals who report substantial or severe alcohol use or related problems.

Community Specific Alcohol-Related Public Health Strategies

Table 5 lists a number of potential strategies for reducing alcohol-related illness, injuries and death in the Wisconsin and Milwaukee County. These strategies are based in part on data presented in this article and from data extracted from a fuller report to the Milwaukee Academy of Medicine.[36] It is beyond the scope of this paper to provide specific guidelines for implementing these potential strategies on a state- or community-wide level. Rather, this paper provides an illustration of how a public health perspective, with attention to characteristics associated with the host, the agent/vehicle and the environment, can direct primary and secondary prevention and control strategies on a state- and local-community level.

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Philip M. Farrell, MD, PhD

Dean's Corner

Integrated Health Sciences Learning: A Dream Becomes Reality

by Philip M. Farrell, MD, PhD, Dean
University of Wisconsin Medical School

With much planning and persistence on the part of many, I am pleased to report that the long-time vision to advance health sciences collectively at the university is materializing. The UW Medical School will soon relocate most of its instructional programs and people associated with them from its long-time base at the old hospital to a new Health Sciences Learning Center adjacent to the Clinical Science Center. The Health Sciences Learning Center has been a collaborative initiative involving all of the health sciences schools (Nursing, Medicine and Pharmacy). Its central feature is interdisciplinary education.

This move has been a long time coming, and we've needed it badly, but it will be worth the wait. Our new facilities will set the standard in instruction and information technology, providing an environment rich in resources for students and established health professionals, who must be focused, self-directed learners to do their jobs most effectively these days.

The new building will be the hub of learning for all health sciences at the University of Wisconsin-Madison. In addition to being physically connected to the Clinical Science Center, it will be easily accessed from the soon-to-be completed pharmacy school building, Rennebohm Hall, as well as the School of Nursing and the Waisman Center. It is anticipated that the physician assistant instructional program will also be based in the new building.

UW's Health Sciences Learning Center will be among the most sophisticated, technologically-advanced educational facilities in the country. It is being designed by Davis Brody Bond of New York, an award-winning architectural firm specializing in educational buildings and libraries, in association with the Milwaukee-based firm Kahler Slater.

Lecture halls in the building will be fully wired with connections for computers at each desk. Three auditoriums–including the proposed 350-seat Alumni Hall–will also feature individual keypads to transmit questions to the lectern, a full spectrum of the latest audio-visual capabilities and comfortable seating, making access convenient for people in wheelchairs.

In the Teaching and Assessment Center, students will learn to make clinical correlations with technologies such as computerized radiological images and tools to analyze cell structure. The large, basic-skills clinic will simulate a patient care environment in which techniques such as airway management, suturing and resuscitation will be taught. In 20 small, multi-purpose classrooms, students will learn methods of interviewing and examining model patients.

In addition to being the instructional base for more than 1,500 UW-Madison health sciences students, the Learning Center will be a beacon to medical, nursing and pharmacy students throughout the state. Its four distance-education classrooms will allow UW faculty to deliver curriculum to more than 200 local hospitals, clinics and classrooms. The newest teleconferencing power will help ensure that practicing clinicians get the continuing education and professional development they need in a most efficient way. The facility will be equipped to transmit voices, images, x-rays and cardiograms to any site able to receive them.

Totaling over 155,000 assignable square feet, the Learning Center will be home to the consolidated health sciences library, a unification of information resources from the Middleton Library, Weston Library and the pharmacy school library. The new library will occupy approximately one-third of the building, extending through two of its four levels. With the increasing emphasis on medical informatics and problem-based medicine, libraries are playing a more critical role than ever before in the health professions.

The Learning Center is expected to house the Medical School Alumni Association, the Office of Continuing Medical Education and other administrative units as well as the dean's office. The

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MetaStar Sets *Right Meds, Right Time* Workshops

By Jay A. Gold, MD, JD, MPH; and Dennis Spurlin

Approximately 50,000 Wisconsin Medicare beneficiaries have at least one inpatient hospitalization each year for acute myocardial infarction (AMI), congestive heart failure (CHF), pneumonia, or acute TIA/stroke. Administering appropriate and timely medications at patient arrival and discharge are essential elements in decreasing the morbidity and mortality associated with these conditions.

MetaStar's *Right Meds, Right Time* project is a collaborative effort to increase the use and timeliness of appropriate medications. The improvement project focuses on helping hospitals develop and improve clinical pathways, standing medical orders and protocols to decrease care variations that may result in less-than-optimal outcomes for patients. In addition, MetaStar will be working directly with physicians throughout the state, recognizing the essential role of medical practitioners in improving care.

MetaStar is sponsoring a series of workshops aimed at helping collaborating hospitals improve indicator rates for the *Right Meds, Right Time* project. The basis for the workshops is understanding and implementing the "Model for Improvement," which is sometimes identified as rapid-cycle improvement. The improvement model is based on institutions answering three fundamental questions:

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement?

The first *Right Meds, Right Time* workshops begin on Monday, July 10, at the Ramada Conference Center in Wausau, or Tuesday, July 11, at the Country Inn Hotel and Conference Center in Waukesha. Participants from hospital interdisciplinary teams will attend one of the two locations for the first workshop. Follow-up workshops will take place about six weeks later at six Wisconsin locations, with a third workshop set to take place about eight weeks later at the same locations.

Inter-disciplinary teams will conduct specific pilots for process improvement based on their answers to the questions listed above. Between the first and second workshops, hospitals will collect data on the

Doctor Gold is Principal Clinical Coordinator and Health Care Quality Improvement Program Director for MetaStar, Inc.; Mr. Spurlin is Communications Specialist.

Right Meds, Right Time Quality Indicators

Pneumonia quality indicators:

- Timely initial antibiotic administration
- Appropriate initial antibiotics
- Blood culture (if done) before antibiotics

AMI quality indicators:

- Early administration of aspirin
- Aspirin at discharge
- Early administration of beta blocker
- Beta blockers at discharge
- ACE inhibitors for low LVEF
- Timely reperfusion
- Smoking cessation counseling provided

CHF quality indicators:

- Assessment of LVEF
- Treatment with angiotensin-related drugs when appropriate

Stroke/TIA/A-fib quality indicators:

- Aspirin or antiplatelets at discharge for ischemic stroke/TIA
- Warfarin for atrial fibrillation
- Avoidance of rapid-acting antihypertensives in acute stroke

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METASTAR

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pilots, and the results will be shared at the second and third workshops.

Clifford L. Norman, co-author of *The Improvement Guide – A Practical Approach to Enhancing Organization Performance*, will conduct the one-day workshops for MetaStar. Based in Austin, TX, and recognized as one of the country's leading quality improvement experts, Norman is a consultant with Associates in Process Improvement (API). API develops methods, works with leaders and teams and provides education and training to help organizations improve their products and services and to build their capacity for ongoing improvement. Participating hospitals will receive copies of *The Improvement Guide* with pre-workshop materials.

The intended audience for the project/workshops includes quality improvement professionals, physicians, nurses, pharmacists, emergency room staff and administrators. Physicians can receive 5.5 Continuing Medical Education (CME) credit hours, and registered nurses can receive 6.6 contact hours for participating in the workshops.

For further information regarding the *Right Meds, Right Time* project, or to sign up for one of the two July workshops, please contact Judy Frisch, RN, Clinical Quality Specialist, at MetaStar, 608.274.1940. Registration may also be completed on-line at MetaStar's web site: www.metastar.com.

DEAN'S CORNER

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building will also feature computer laboratories and training rooms, offices for student organizations, several lounges, group study rooms, a café, a retail store, conference rooms, study carrels and lockers. A 155-space parking lot will be constructed beneath the building.

Groundbreaking is scheduled for early fall of 2001. Though many steps still must be taken before the first shovel of dirt is thrown, we can all be confident that the Learning Center will greatly enhance our instructional strength. It is a project that serves not only our students but the entire state of Wisconsin.

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All manuscripts will be edited by the *WMJ* staff for clarity, organization, grammar, spelling, and punctuation, and in accordance with AMA style (*AMA Manual of Style*, 9th ed, and *AMA Manual for Authors and Editors*). Suggestions for titles are welcome, but are subject to the constraints of clarity, space, grammar and style.

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Organization for scientific papers. The following outline is recommended:

Abstracts-150 words or less, stating the problem considered, methods, results and conclusions. Cite no references.

Methods-Describe the selection of observational or experimental subjects, including controls. Identify the methods, procedures and equipment well enough to allow replication.

Results-Provide results in the test, tables or illustrations. If tables or illustrations are used, emphasize or summarize only the most important observations in the text.

Discussion-Discuss the conclusions that follow from the results, as well as their limitations and relations to other studies. Show how the conclusions relate to the purpose of the study. Recommendations, when appropriate, may be included.

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Do not use abbreviations in the title or abstract, and limit their use in the text. Acceptable abbreviations of clinical, technical and general terms can be found in the *AMA Manual for Authors and Editors* and *AMA Manual of Style*.

Avoid the use of medical jargon. Words or phrases that are particular to conversations among medical personnel are inappropriate in scientific writing. (Examples: For "presented with" use "had;" for "experienced a weight loss" use "lost weight.")

Supply the full and correct names of drugs. Use generic names of drugs, unless the specific trade name of a drug is directly relevant to the discussion. If the author so desires, brand names may be inserted in parentheses.

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ies along with an electronic version on an IBM-compatible disk so we will be able to move forward with publication in a timely manner.

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Each scientific manuscript is reviewed by the medical editor and the members of the editorial board. The opinions of outside consultants may be sought at the medical editor's discretion. The medical editor has the final decision as to whether a scientific paper will be published.

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CONFERENCE REPORTS

The Editorial Board will be pleased to consider publication of brief conference reports. The following ground rules will apply:

- Only reports of single-topic conferences held in Wisconsin will be considered.
- The conference topic should have interest for a wide group of Wisconsin physicians, e.g., Alzheimer's Disease, AIDS.
- The author should be the conference chair (or designee).
- The report should focus primarily on what is "new and important" that can and should be used by the reader.
- BRIEF is defined as six pages, double-spaced typing. In addition, the author may provide a one-page, double-spaced background statement as to why the content of the report is important for Wisconsin physicians.
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WMJ • Volume 99, No. 4

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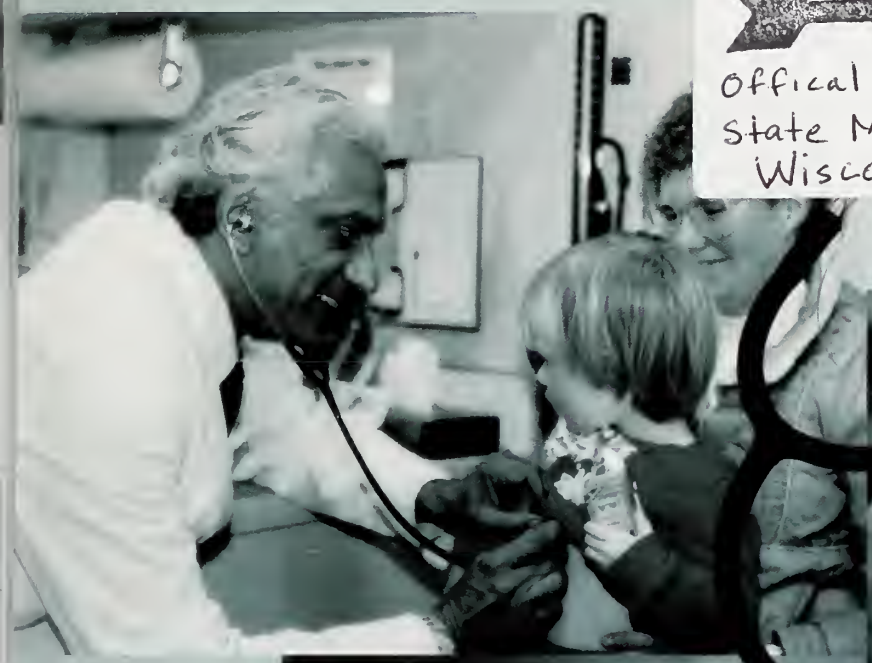

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PIC WISCONSIN

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In Step with the Changing Face of Medicine

"At no other time in history have physicians of all race, denomination and even gender brought greater diversity to our field," said Ayaz M. Samadani, MD, during his presidential inaugural address.

In this new millennium, the State Medical Society of Wisconsin is striving to ensure that its collective voice truly represents diversity, and remains focused on advancing the health of the people of Wisconsin.

As part of this effort, Dr. Samadani has dedicated his presidential tenure toward organ and tissue donation awareness. His goal is to increase comfort levels among physicians to discuss end-of-life issues and encourage organ and tissue donation with patients.

Doctor Samadani, pictured with one of his patients on the cover, is the first international medical graduate to serve as SMS president.

Cover design by Kendi Parvin, *WMJ* Managing Editor. Annual Meeting photography by Carole Pollack, Carole Pollack Photography, Milwaukee, and Kendi Parvin.

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Created by the Territorial Legislature in 1841 and now representing over 8,000 member physicians, the Society's purpose is to "advance the health of the people of Wisconsin." The major activities of the Society concern advocacy for patients and physicians, medical education, peer review, statewide health education, scientific affairs, socioeconomics, health planning, service to physicians, operation of the SMS Foundation, and publication of the *Wisconsin Medical Journal.*

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Working together is key to advancing Wisconsin's health

Ayaz M. Samadani, MD
SMS President

Recent polls have showed that health care issues are the number one priority of the American people. In this election year, physicians have the awesome responsibility of advocating for the best interests of their patients and their profession. Fortunately, the State Medical Society of Wisconsin (SMS), unites over 8,000 physicians to represent the health care community in this endeavor.

It is crucial today that physicians continue their active and unified role in the discussions and actions shaping the future of medical care. **Decisions are being made today by the government, managed care corporations and insurance companies about the patient/physician relationship, telemedicine, health care cost and quality, and practice parameters as well as many other important issues.** These decisions have an immeasurable effect on our future.

Established in 1841, the SMS is the first and largest physician and patient advocacy association in the state. The purpose of the SMS is to advance the health of the people of Wisconsin through **advocacy, professionalism and community.**

This past year SMS physicians were able to advance health care in a number of ways. Some accomplishments include:

- Achieving a **significant victory in our campaign to protect the privacy of patients' medical information** through a compromise plan which prevents a patient's "medical record" (medical information and patient-identifying information) from being sent to the state;
- Shepherding **Independent External Review legislation** through the legislature, providing a patient with the right and opportunity to request an independent, impartial decision about grievances with their health care plans;
- **Reducing Patients Compensation Fund Fees by 25%** effective for the Fiscal Year beginning July 1, 2000. **Overall, this will result in nearly $11 million in savings for physicians;** and
- **Preventing a repeal of the $350,000 cap** on non-economic damages. Had the 1995 non-economic damages cap been repealed, PCF fees would have immediately increased by 24 percent.

Our history of undertakings goes much further than the past year however. Through the SMS, Wisconsin physicians:

- have been pioneers in many public health efforts including programs to help curb teen smoking;
- developed and published the *WMJ*, a medical journal devoted to the interests of the medical profession and health care in Wisconsin;

Membership Demographics for Year Ending 1999

Total Membership: 8192

Female: 1396

Male: 6488

≤ 40: 1910

Resident/PG-I: 444

Student: 193

International Medical Graduates: 958

University of Wisconsin Medical School Graduates Practicing in Wisconsin: 1629

Medical College of Wisconsin Graduates Practicing in Wisconsin: 1885

- have been instrumental in the development of the state's medical schools;
- developed one of the first peer review monitoring and physician health programs;
- began serving the volatile medical malpractice insurance market by offering affordable professional liability coverage though the creation of PIC Wisconsin; and
- led and continue to accredit continuing medical education in Wisconsin.

I joined the SMS in 1971 and have been an active member ever since. The SMS has been a tremendous advocate for my patients and for my right to practice medicine in the best interests of those patients. I have found the SMS to be receptive and responsive, and I've seen firsthand how the collective voice of physicians can influence public policy and public health.

I have also seen the positive outcome of working together to improve public health. At the start of my presidential term, I launched a campaign to educate physicians about the need to talk with patients about organ and tissue donation. Physicians have participated in statewide end-of-life seminars, the SMS joined the WPS *ORGANize to Save Lives* campaign, we worked with the State Bar of Wisconsin in publishing organ and tissue donation forms, distributed organ donor stickers and have been recognized by the media and Governor Thompson for our efforts.

The SMS has also taken the lead on improving patient safety. By sponsoring patient safety forums with leaders from health care, insurance companies, the legal profession and business, our goal is to develop and encourage the best treatment practices for the reduction of medical errors.

Your membership in the State Medical Society of Wisconsin is not only a smart professional decision—it can also help save you money. When using the services provided by the SMS, the average physician saves nearly double their dues costs every year. One example of this is the products available through SMS Insurance Services. By taking advantage of member discounts, you could save over $1,500.

The SMS is dedicated to providing members with timely information. In addition to the published materials you will receive, WISMED (www.wismed.org) offers daily, up-to-date information about the SMS. As a service to the people of Wisconsin, WISMED now includes the "Wisconsin Physician Directory," Wisconsin's only physician directory that patients can use to search for a physician. The directory provides information on **every** licensed physician in Wisconsin. The extensive, searchable database includes online details about physicians' practices and helpful information for patients and professional referrals. I encourage you to visit www.wismed.org to verify that your correct information is listed.

Thank you for your commitment to SMS. The strength of the profession rests with Wisconsin physicians working together to reach common goals.

Put Us To The Test

Our Industry Dynamics The $32 billion clinical laboratory industry is on the brink of a new era in which it is playing a dramatically expanded role in health care. No longer simply a diagnostic tool, laboratory testing is now an integral part of the continuum of medical evaluation and treatment. This greater clinical role, combined with significant demographic and economic dynamics, is creating a vast new landscape of opportunity and increased demand for laboratory testing.

Advances in Technology: Acceleration in the development of new technologies providing better and earlier disease diagnosis, accompanied by new treatments and therapeutics, will result in new diagnostic and monitoring tests. Most of these are esoteric tests—special tests performed by highly-trained professionals using sophisticated equipment and technologies.

Growth of Esoteric Testing: Scientific advances are driving the development of more esoteric tests. Significant accomplishments have been made in the areas of infectious disease, genetics and oncology.

Emphasis on Prevention: Better disease management is a key part of lowering health care costs and is a significant focus of health care providers such as managed care companies. Preventive screening and routine testing are critical elements of this overall effort.

Public Awareness: Patients today are taking a more active role in managing their own health care. Internet access, health wellness programs, and the high visibility generated by prominent public figures addressing health care issues are some of the trends driving a high level of awareness. This creates corresponding demand for new technological testing procedures from individual patients.

Aging of Population: Over the next decade, the number of people over age 65 will grow approximately one percent annually to 39.5 million by 2010. An aging population carries with it increased incidence of disease which will drive testing volume.

Industry Consolidation: Large commercial labs are expected to increase market share as hospital and physician labs re-evaluate the profitability of internal lab operations which are challenged by economies of scale and stringent regulatory requirements.

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SMS 2000–2001 Officers

Ayaz M. Samadani, MD
2000-2001

Ayaz M. Samadani, MD, President

148 Warren St, Beaver Dam 53916

A family physician, Dr. Samadani received his medical degree in Pakistan. He served his internship at Henrotin Hospitals in Chicago and spent five years of post graduate training in internal medicine and pediatrics in London. He is a fellow of the Royal Society of Tropical Medicine and Hygiene and is certified in child health from the Royal College of Physicians and Surgeons in London. He has been in practice in Beaver Dam since 1971 and is past chief of staff and chair of the pediatrics department at Beaver Dam Community Hospital. Doctor Samadani has served as secretary and president of Dodge County Medical Society and as its delegate to the SMS. He is past president of the Wisconsin chapter of the Association of Pakistani Physicians of North America and is founding chair of the IMG (International Medical Graduates) section of the SMS.

An SMS director since 1991, Dr. Samadani is a member of the Council on Medical Practice Research and Education. He is also a fellow of the American Academy of Family Physicians.

Raymond C. Zastrow, MD
2000-2001

Raymond Zastrow, MD, President-Elect

504 Ponderosa Dr, Hartland 53029-8642

Doctor Zastrow, who specializes in anatomic and clinical pathology, graduated from Marquette University School of Medicine (now the Medical College of Wisconsin). He served on the SMS Physicians Alliance Commission from 1977 to 1989, and was a member of the WISPAC Board of Directors. He served as chair of the SMS Bylaws Committee, was a member of the Finance Committee and was an alternate delegate to the AMA from 1983 to 1986. Doctor Zastrow has also served on the AMA Ad Hoc Committee on the Health Policy Agenda for the American People (HPA). He was a member of the SMS Board of Directors from 1987 to 1998, serving as vice-chair from 1991 to 1995, and chair from 1995 to 1998. He has been a delegate to the AMA since 1998. He is also past president of The College of American Pathologists.

Jack M. Lockhart, MD
2000-2001

Jack M. Lockhart, MD, Immediate Past President

1836 South Ave, La Crosse 54601

Jack M. Lockhart, MD, is Board certified in internal medicine and rheumatology. Doctor Lockhart graduated from Harvard Medical School and served an internship at University Hospitals of Cleveland, Cleveland, Ohio. He completed fellowships at the University of Minnesota Medical School in Minneapolis where he was an instructor from 1976-1977, and has been a clinical lecturer with the University of Iowa since 1982.

An active member of the SMS for more than 20 years, Dr. Lockhart served as a member of the Board of Directors from 1989-1998 and as Treasurer from 1997-1998. He served on the Finance Committee for nine years, including one year as Chair. He was a member of the Nominating Committee from 1986-1990 and a member of the WISPAC Board of Directors from 1990-1992. He was a member of the Physicians Alliance Commission (now Governmental Affairs) for nine years, and also served as a delegate to the SMS House of Delegates. Doctor Lockhart is currently serving on the Board of SMS Holdings.

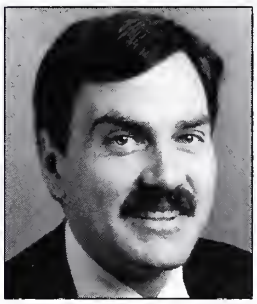
A past president of the La Crosse County Medical Society (1993-1994), Doctor Lockhart has also held numerous leadership positions with Gundersen Lutheran Medical Center, La Crosse. He served as Chair of the Department of Internal Medicine (1993-1998).

John E. Patchett, JD

John E. Patchett, JD, Executive Vice President & Secretary

330 E Lakeside St, PO Box 1109, Madison 53701

Before joining the SMS in October, 1996, John Patchett, JD, served as Deputy Executive Vice President of the Florida Medical Association. Prior to that, he spent 10 years on the staff of the American Medical Association – four years in Specialty Society Relations and six years as Director of the Department of State Legislation. He served in the Iowa House of Representatives from 1973 to 1980. Mr. Patchett earned his Juris Doctorate degree from the University of Iowa School of Law.



Brad L. Manning, MD
2000–2001

Brad L. Manning, MD, Treasurer, Director, District 1

1108 Nishishin Trail NE, Madison 53716-2981

Doctor Manning, whose specialty is plastic and reconstructive surgery, graduated from the University of Illinois College of Medicine and completed his general surgery and plastic surgery residency at the University of Wisconsin-Madison. He has served as a trustee and president of the Dane County Medical Society. He was chair of the department of surgery and president of the medical staff at Meriter Hospital. He served on the SMS Task Force on Health Care Reform and on the Commission on Public Information. He has served as a delegate for the SMS and is currently a director, serving as Treasurer, and a member of the Council on Health Care Access & Financing. He is also a member of the SMS Holdings Board.

Michael C. Reineck, MD
1996/1999-2001

Michael C. Reineck, MD, Speaker of the House

205 Valley Ave, West Bend 53095-8779

Doctor Reineck graduated from the University of Wisconsin in 1970 and completed an internship at Milwaukee County General Hospital and a residency at St Mary's Hospital, in affiliation with the Medical School of the University of Michigan, in Grand Rapids. He is in private orthopedic practice in West Bend. Doctor Reineck is past chair of the SMS Governmental Affairs Committee, and past president of the Wisconsin Orthopaedic Society and the Washington County Medical Society. He is also a past member of the Wisconsin Professional Liability Committee. He is a member of the American Academy of Orthopaedic Surgeons Committee on Occupational Health. He was the Washington County Medical Society delegate to the SMS House of Delegates for 11 years prior to his election as vice speaker in 1994.

Kevin T. Flaherty, MD
1996/2000-2002

Kevin T. Flaherty, MD, Vice Speaker of the House

614 First St, PO Box 689, Wausau 54402-0689

Doctor Flaherty received his medical degree from Loyola University in Chicago. He served an internship at Sacred Heart Medical Center in Spokane, WA, and residency at Loyola University in ophthalmology. He took post residency training in corneal transplant surgery at the University of Louisville in Louisville, KY, and in ophthalmic plastic and reconstruction surgery at the Massachusetts Eye and Ear Infirmary at Boston, MA. He has been in practice in Wausau for 11 years. He serves as president of his group at the Eye Clinic of Wisconsin. He is past president of the Wisconsin Academy of Ophthalmology and serves on its executive committee. He is also a past president of Marathon County Medical Society. He has chaired reference committees at the Young Physicians Section of the AMA and SMS. In 1995, Dr. Flaherty was elected as an alternate delegate to the Wisconsin delegation of the AMA and elected delegate in 1998. He also served as chair of the reference committee on Rules and Credentials at the 1999 AMA Interim Meeting.

Mark H. Andrew, MD
2000-2001

Mark H. Andrew, Chair, Board of Directors
Vernon Memorial Hospital, Viroqua 54665

Doctor Andrew, a general surgeon at Vernon Memorial Hospital in Viroqua, graduated from the University of Wisconsin Medical School, and served his internship and residency at Southwestern Michigan Area Health Education Center in Kalamazoo. He was chair of the Young Physicians Section of SMS in 1991. He has been a member of the SMS Council on Government Affairs (1990-1999), and president of the Vernon County Medical Society since 1989. He has been on the SMS Nominating Committee (1993-1999), including serving as chair (1998-1999) and is on the WISPAC Board of Directors. Doctor Andrew is a Fellow of the American College of Surgeons, and is a member of the Wisconsin Surgical Society, the American Society of General Surgeons, the Society of Laparoendoscopic Surgeons and the American Medical Association.

Robert E. Phillips, MD
2000-2001

Robert E. Phillips, MD, Vice Chair, Board of Directors
1000 N Oak Ave, Marshfield 54449-5777

Doctor Phillips, a general internist and geriatrician, received his medical degree from Northwestern University Medical School in Chicago, and served his residency in internal medicine at the University of Minnesota Affiliate Hospitals. Doctor Phillips has been in practice at the Marshfield Clinic since 1979. He has been a member of the SMS since 1979, and has served on the Commission on Mediation and Peer Review, Commission on Geriatric Health, and was chair of the Commission on Public Information. Doctor Phillips was the ad hoc chair of the State Mini-Internship Committee and has been a delegate to the SMS since 1988. He is also a past president of the Wood County Medical Society. Doctor Phillips was a member of the SMS Nominating Committee from 1990-1995, serving as chair in 1992-1993. In addition, Doctor Phillips was president of the Wisconsin Association of Medical Directors in 1989, and president of the Wisconsin Society of Internal Medicine in 1990. He also served on the Task Force for Health Care Reform of Wisconsin Care in 1993. Doctor Phillips is a member of the American College of Physicians/American Society of Internal Medicine, American Medical Directors Association, American Geriatric Society and American Medical Association. He is chair of the SMS Membership Committee (1999 to present), member of the SMS Council on Health of the Public (1999 to present) and clinical professor of medicine at the University of Wisconsin Medical School.

SMS 2000-2001 Directors

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Note:
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James D. Buck, MD
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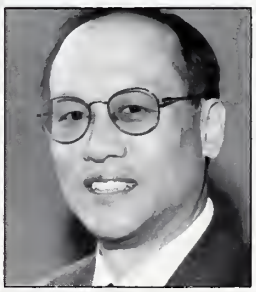
157300 Brentwood Dr
Brookfield 53005-1020



Clarence P. Chou, MD
District 1
(1994/1999-2002)
10028 N Miller Dr, 2W
Mequon 53092-6186

Gerald G. Govin, MD
District 1
(1996/1999-2002)
15720 Mark Dr
Brookfield 53005-3579

Charles E. Holmburg, MD
District 1
(1996/1999-2002)
W180 N7950 Town Hall Rd, PO Box 427
Menomonee Falls 53051-0427

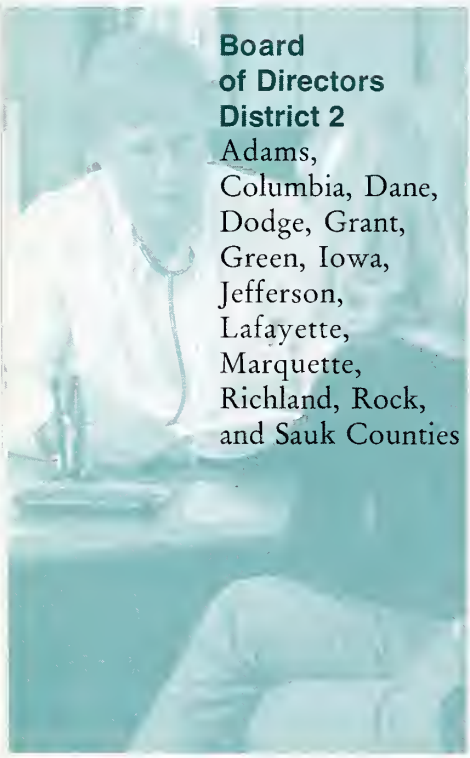
Thomas J. Luetzow, MD
District 1
(1999/1999-2002)
N7406 County Rd E
Watertown 53094-9533

David J. Matteucci, MD
District 1
(1995/1999-2002)
5004 22nd Ave
Kenosha 53140-5923

Edith A. McFadden, MD
District 1
(2000/2000-2003)
2823 N Summit Ave
Milwaukee 53211-3439

Evan K. Saunders, MD
District 1
(1998/1998-2001)
2901 W KK River Pkwy, #417
Milwaukee 53215-3660

Gregory A. Shove, MD
District 1
(1999/1999-2002)
3807 Spring St
Racine 53408-5001



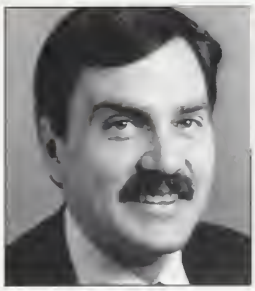
Board of Directors District 2
Adams, Columbia, Dane, Dodge, Grant, Green, Iowa, Jefferson, Lafayette, Marquette, Richland, Rock, and Sauk Counties

Cassandra P. Welch, MD
District 1
(1995/1998-2001)
2770 N Fifth St
Milwaukee 53212-2354

John W. Beasley, MD
District 2
(1996/1999-2002)
777 S Mills St
Madison 53715-1849

Jerry M. Ingalls, MD
District 2
(1992/2000-2003)
N5080 Hyland Cir
Monticello 53570-9621

Susan K. Kinast-Porter, MD
District 2
(2000/2000-2003)
515 22nd Ave
Monroe 53566-1569



Bradley L. Manning, MD
District 2
(1995/1998-2001)
1108 Nishishin Trail NE
Madison 53718-2981

Alan I. Schwartzstein, MD
District 2
(1997/2000-2003)
753 N Main St
Oregon 53575

Paul A. Wertsch, MD
District 2
(1993/2000-2003)
4221 Venetian Ln
Madison 53718-6655

Mark H. Andrew, MD
District 3
(1992/1998-2001)
Vernon Memorial Hospital
507 S Main
Virocqua 54665

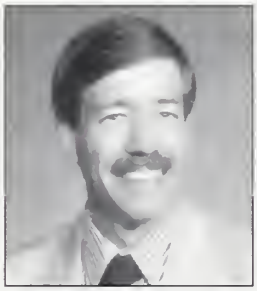
Gary L. Bryant, MD
District 3
(1998/1998-2001)
1836 S Ave
La Crosse 54601-5429

Board of Directors District 3

Buffalo, Crawford, Jackson, Juneau, La Crosse, Monroe, Trempealeau, and Vernon Counties

Steven C. Bergin, MD
District 4
(1997/2000-2003)
617 Linwood Ave
Stevens Point
54481-4428

James R. Keuer, MD
District 4
(1995/1998-2001)
9601 Townline Rd
PO Box 1390
Minocqua 54548-1390



Robert E. Phillips, MD
District 4
(1995/1998-2001)
1000 N Oak Ave
Marshfield 54449-5777

Board of Directors District 4

Clark, Florence, Forest, Langlade, Lincoln, Marathon, Oneida, Portage, Price, Taylor, Vilas, and Wood Counties

Board of Directors District 5

Calumet, Fond du Lac, Green Lake, Outagamie, Waupaca, Waushara, and Winnebago Counties

Susan L. Turney, MD
District 4
(1999/1999-2002)
1000 N Oak Ave
Marshfield 54449-5777

Johan A. Mathison, MD
District 5
(1999/1999-2002)
712 Doctors Ct
Oshkosh 54901

Kevin F. Quinn, MD
District 5
(1995/1998-2001)
1147 Glenayre
Neenah 54956-4235

Board of Directors District 6

Brown, Door, Kewaunee, Manitowoc, Marinette, Menominee, Oconto, Shawano, and Sheboygan Counties

David R. Weber, MD
District 5
(1997/2000-2003)
149 Cottage Ave
Fond du Lac
54935-3627

John J. Beck, MD
District 6
(1998/1998-2001)
330 S 16th Pl
Sturgeon Bay
54235-1457

Robert K. DeMott, MD
District 6
(2000/2000-2003)
704 S Webster Ave
Green Bay 54301

etcetera

Board of Directors Ex-officio Members

John E. Patchett, JD, Executive Vice President & Secretary
Medical College of Wisconsin – Michael J. Dunn, MD, Dean and Executive Vice President
University of Wisconsin Medical School – Philip M. Farrell, MD, PhD, Dean
WHA – Ford Titus, President/CEO, Waukesha Memorial Hospital
Jenny Bowe, Medical Student, UW-Madison
Steve Klein, Medical Student, MCW-Milwaukee

Delegates to the AMA

Susan L. Turney, MD (1995/2000 & 2001)
1000 North Oak Ave, Marshfield 54449-5777
Kenneth M. Viste, Jr, MD (1993/2000 & 2001)
100 Stoney Beach Rd, Oshkosh 54901-7243
Raymond C. Zastrow, MD (1997/2000 & 2001)
504 Ponderosa Dr, Hartland 53029-8642
Kevin T. Flaherty, MD (1999/2000-2002)
614 First St, PO Box 689, Wausau 54402-0689
Cyril M. Hetsko, MD (1994/2000-2002)
1313 Fish Hatchery Rd, Madison 53715-1911
Kevin A. Jessen, MD (1998/2000-2002)
N5115 Oak Hill Rd, Fond du Lac 54935

Alternate Delegates to the AMA

Clarence P. Chou, MD (1999/2000 & 2001)
10028 N Miller Dr, 2W, Mequon 53092-6186
Robert J. Jaeger, MD (1995/2000 & 2001)
1418 W Chippewa Tr, Mosinee 54455
Richard G. Roberts, MD (1996/2000 & 2001)
777 South Mills St, Madison 53715
Mahendr S. Kochar, MD (2000/2000-2002)
8701 Watertown Plank Rd, PO Box 26509, Milwaukee 53226-0509
Timothy G. McAvoy, MD (1997/2000-2002)
1751 East Main, Waukesha 53186-3940
Michael M. Miller, MD (2000/2000- 2002)
309 W Washington Ave, Madison 53703-2701

Note: Officers, directors, delegates, alternate delegates, and members of councils are elected at the SMS Annual Meeting. AMA delegates and alternate delegates' terms of office are on a calendar basis, although elected at the Annual Meeting.

Linda J. Werner, MD
District 6
(1998/1998-2001)
2935 Shore Dr
PO Box 1056
Marinette 54143-4237

Charles V. Ihle, MD
District 7
(1994/2000-2003)
1400 Bellinger St
Eau Claire 54703

Daniel R. Sherry, MD
District 7
(2000/2000-2003)
230 W Cairns
Ellsworth 54011-9085

Board of Directors District 7

Barron, Chippewa, Dunn, Eau Claire, Pepin, Pierce, Polk, Rusk, St Croix, Burnett, and Washburn Counties

Mark K. Belknap, MD
District 8
(1996/1999-2002)
922 Second Ave W
Ashland 54806-3130

Matthew C. Carnahan, MD
Resident Fellow Section
(2000/2000-2001)
608 N 90 St, #2
Wauwatosa 53226

Board of Directors District 8

Ashland, Bayfield, Douglas, Iron, and Sawyer Counties

Committees of the Board

Executive Committee
Ayaz M. Samadani, MD, Beaver Dam
President of the Society
Raymond C. Zastrow, MD, Milwaukee
President-elect of the Society
Jack M. Lockhart, MD, La Crosse
Immediate Past President of the Society
Mark H. Andrew, MD, Viroqua
Chair of the Board
Robert E. Phillips, MD, Marshfield
Vice Chair of the Board
Bradley L. Manning, MD, Madison
Chair of the Finance Committee
Michael C. Reineck, MD, West Bend
Speaker of the House of Delegates
Clarence P. Chou, MD, Mequon, Director at large
Jerry M. Ingalls, MD, Monticello, Director at large

Ex Officio non-voting members:
Carol Harding, Neenah, Alliance President
Kathleen Schneider, Wauwatosa
Alliance President-elect

Finance Committee
Bradley L. Manning, MD, Madison
Mark K. Belknap, MD, Ashland
Steven C. Bergin, MD, Stevens Point
Gary L. Bryant, MD, La Crosse
Gerald C. Govin, MD, Brookfield
Charles E. Holmburg, MD, Menomonee Falls
Charles V. Ihle, MD, Eau Claire

Membership Committee
Robert E. Phillips, MD, Marshfield
Steve C. Bergin, MD, Stevens Point
Gary L. Bryant, MD, La Crosse
Gerald G. Govin, MD, Brookfield
Jean Larson, Madison
Wendy L. Larson, MD, Milwaukee
David J. Matteucci, MD, Kenosha
Sandra L. Osborn, MD, Verona
Evan K. Saunders, MD, Milwaukee
Alan I. Schwartzstein, MD, Oregon
Gregory A. Shove, MD, Racine
Linda J. Werner, MD, Marinette
Tosha B. Wetterneck, MD, Madison
Pamela A. Wilson, MD, Madison
Deanna Johnson, MD, Madison

Charter Law of the SMS

Chapter 148

148.015 State society.(1) The State Medical Society of Wisconsin is continued with the general powers of a corporation. It may, from time to time adopt, alter and enforce constitution, bylaws and regulations for admission and expulsion of members, election of officers, and management.

(2) A member expelled from a county medical society may appeal to the state society, whose decision shall be final.

148.02 County societies. (1) The physicians and surgeons, not less than five in number, of the several counties, except those wherein a county medical society exists, may meet at such time and place at the county seat as a majority agree upon and organize a county medical society, and when so organized it shall be a body corporate by the name of the medical society of such county, shall have the general powers of a corporation, and may take by purchase or gift and hold real and personal property. County medical societies now existing are continued with the powers and privileges conferred by this chapter.

(2) Physicians and surgeons who, before April 20, 1897, received a diploma from an incorporated medical college or society of any of the United States or territories or of any foreign country, or who shall have received a license from the medical examining board, shall be entitled to meet for organization or become members of the county medical society.

(3) If there is not a sufficient number of physicians and surgeons in any county to form a county medical society they may associate with those of adjoining counties, and the physicians and surgeons of not more than 15 adjoining counties may organize a county medical society under this chapter, meeting at such time and place as a majority agree upon.

(4) A county medical society may from time to time adopt, alter and enforce constitution, bylaws and regulations for the admission and expulsion of members, election of officers, and management, not inconsistent with the constitution, bylaws and regulations of the state society.

148.03 Service insurance corporations for health care. The state medical society or, in a manner approved by the state society, a county society, may establish in one or more counties of this state a service insurance corporation for health care under ch. 613.

Note on §148.03, 447.13, and 449.15: Chapter 613 provides in general terms for the creation, governance and regulation of service insurance corporations for any kind of health care, as well as for other types of services. All that is needed in each authorizing chapter for professional societies is a brief section giving the appropriate professional society the power to organize a ch. 613 corporation. Section 148.03 creates that section for health care.

One basic restriction results from the repeal of the old enabling sections: none of the professional societies will be able to organize a service insurance plan within its own corporate structure. It is a mistake to permit such a mixing of professional and insurance activities within the same corporation. The society can, of course, control the service insurance corporation it creates under ch. 613, but the service insurance corporation will be legally separate. This will lead to more effective (and appropriate) control by the insurance commissioner, who should neither be empowered nor compelled, as arguably he was under the old statutes, to have any concern about the purely professional activities of the societies, because of the impossibility of disentangling the insurance and professional activities carried on by a single corporation.

Constitution

Article I
Name of the Association

The name and title of this organization shall be the State Medical Society of Wisconsin.

Article II
Purpose

The purpose of the Society is to bring together the physicians of the state of Wisconsin to advance the science and art of medicine and the better health of the people of Wisconsin, and to secure the enactment and enforcement of just medical laws. As used in the Constitution and Bylaws, "physician" means a doctor of medicine or a doctor of osteopathy licensed in Wisconsin.

As adopted by the House of Delegates, April 2000

Article III
Component Societies

Component societies shall consist of those county medical societies chartered by the House of Delegates of this Society.

Article IV
Composition of the Association

This Society shall consist of members whose dues and assessments for the current year have been received by the Society executive vice president in accordance with the schedule provided in the Bylaws; and who shall be the members of and certified by the applicable active component county medical societies.

Article V
House of Delegates

The House of Delegates shall be the legislative body of

the Society and shall consist of:

(1) delegates elected by those members of the component county medical societies who are also members of the State Society or, in counties with no active county medical society, by those members whose principal places of practice are located within the geographic boundaries of the county.

(2) one delegate representing each specialty section of the Society, and one or more delegates representing each of the two medical student special sections, organized under the Bylaws,

(3) a speaker,

(4) a vice speaker.

The officers of the Society enumerated in Article IX of this Constitution, directors, and past presidents of the Society shall be ex officio members, but without the right to vote, except that if they have been duly seated as delegates, they shall have the right to vote. The speaker and vice speaker shall be elected by and from the House of Delegates for two-year terms, and shall be limited to three consecutive full terms in their respective offices. While holding these offices, they shall be members of the House at large and shall not represent any component county society or specialty society.

Article VI
Board of Directors

The Board of Directors, hereinafter referred to as "Board," shall have full authority and power of the House of Delegates between sessions of the House. It shall consist of the resident physician and district directors, immediate past president, president, president-elect, treasurer, speaker and vice speaker of the House of Delegates. The executive vice president shall be an ex officio member of the Board, but without the right to vote. A majority of its voting members shall constitute a quorum. One resident physician director shall be elected by the members of the resident physician section of the Society. District directors shall be elected from eight geographic districts whose boundaries shall be determined by the House of Delegates. There shall be elected one director from each district. In addition, there shall be elected director(s) from each district based on a formula using the number of members in each district as the numerator and the total membership of the Society as the denominator, rounded to the nearest whole number. This calculation shall be made every third year, and, as nearly as possible, is to provide for no more than 31 district directors and shall be based on the year end membership totals. The number of directors established for each district shall be approved by the Board and shall be reported to the districts by the executive vice president before annual elections to the Board. As nearly as possible, one-third of the district director members of the Board shall be elected each year. Each district director shall be nominated and elected only by the elected delegates of the county medical society or societies from the district in which the director's principal place of practice is located, or in counties with no active county medical society, by those members of this Society whose principal places of practice are located within the geographic boundaries of the county. District and resident physician director elections shall be subject to the approval and confirmation of the House of Delegates. The terms of the district directors shall be for three years. The term of the resident physician director shall be for one year. No individual shall be permitted to serve more than three consecutive three-year terms as a district director or four consecutive one-year terms as the resident physician director, and no more than a total of six terms of service as a district director or a combined total of seven terms of service as the resident physician director and a district director shall be permitted.

Article VII
Specialty Sections

The House of Delegates shall provide for a division of the Society into specialty sections.

Article VIII
Meetings

Section 1. The Society shall hold an annual meeting, at which time the House of Delegates shall meet to conduct its business. The annual meeting may also include scientific sessions as determined by the Board.

Sec 2. The place for holding each annual meeting shall be fixed by the House of Delegates, or by failure to act, such authority is delegated to the Board. The time and the place for holding each annual meeting shall be approved by the Board.

Sec 3. Special meetings of the House of Delegates shall be called by the speaker on written request of twenty delegates representing at least 10% of the Society's membership in component county medical societies, or the membership in counties with no active county society, or on request of a majority of the Board. When a special meeting is called, the speaker shall set the time and place. The executive vice president shall mail a notice to the last known address of each member of the House of Delegates at least twenty days before the date of the special meeting. The notice shall specify the time and place of the meeting and the purpose for which the meeting is called. The meeting shall consider no business except that for which it is called.

Article IX
Officers

Officers of this Society shall be a president, a president-elect, an executive vice president, and a treasurer. The president-elect and treasurer shall be elected annually by the House of Delegates. The executive vice president shall be elected and the treasurer shall be nominated annually by the Board. The president-elect shall automatically succeed to the office of president at the conclusion of the term as president-elect. The treasurer shall be limited to nine consecutive terms and must be a director of the Board. No person shall hold more than one of the following offices concurrently: president, president-elect, executive vice president, treasurer, speaker, vice speaker, director, except that the treasurer is a member of the Board. Incumbents shall serve until their successors are elected and installed.

Article X
Funds and Expenses

Funds may be raised by annual dues or by assessment on the members, or in any other manner approved by the House of Delegates. The House may establish regular and special classifications of membership. Dues, if any, shall be applied equitably to all members in each class. All resolutions adopted by the House of Delegates providing for appropriations shall be referred to the Board for implementation. All expenditures approved by the Board shall be included in the annual budget.

Article XI
Referendum

The House of Delegates may, by a two-thirds vote of those registered at that session, submit any question to the membership of the Society for its vote, except amendments to the Constitution. Such amendments are governed by Article XIII. The House shall determine prior to submission whether a referendum shall be advisory or binding, and so advise the membership at the time of submission. A majority vote of all the members of the Society shall determine the question on a binding referendum.

Article XII
Seal

The Society shall have a common seal. The power to change or renew the seal shall rest with the House of Delegates.

Article XIII
Amendments

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the members of the House present at any annual meeting, provided that such amendment shall have been introduced in the form of a constitutional amendment in open session at the previous annual meeting, and that it shall have been published at least once during the year in the Journal of this Society, or sent to each member of the Society at least two months before the meeting at which final action is to be taken, except for Article IV, which may be amended at any annual meeting by a two-thirds vote of the delegates present, if the proposed amendment has been properly published or sent to each member, submitted to the House of Delegates and has laid over for one session of that annual meeting.

Bylaws

Chapter 1
Membership

Section 1. The name of a physician on the official roster of this Society, after it has been properly reported by the secretary of the county society, shall be prima facie evidence of membership and of the right to benefits, except those physicians with no active county medical society are not required to maintain county medical society membership as a condition of membership in this Society.

Sec 2. No person whose name has been dropped from the roll of members of a component society or this Society shall be entitled to any of the rights or benefits of this Society, except that such rights and benefits shall continue during the period of an appeal by such person to the Board of Directors.

Sec 3. Every physician who holds a license to practice medicine and surgery in Wisconsin shall be eligible to apply for membership. Each county society shall be the judge of the initial and continuing qualifications of its members, as well as the appropriate membership classification. Members will conduct themselves in a manner which is not in conflict with the purposes for which the Society is organized and is operating.

Sec 4. A county medical society must accept or reject a request for physician membership within sixty (60) days of receiving the application for membership. In the event a county medical society is unable to act on a physician membership application within the aforementioned time frame, the physician may withdraw the application from that county society and resubmit an application for membership to the State Medical Society's Board of Directors or designated committee, or another county medical society as provided in Sec. 6.

Sec 5. A member of either a component society or this Society whose license has been revoked, suspended, non-renewed, or voluntarily surrendered, shall be immediately and automatically suspended from membership as of the date of revocation, suspension, non-renewal, or voluntary surrender, pending definitive action by the Board.

Sec 6. A physician's county society membership must be held in that county in which the physician's principal place of practice is located. However, a physician may hold membership in that county most convenient for attending meetings, with concurrence of the component society in which the principal place of practice is maintained. If a physician's primary county medical society is inactive, the physician may choose membership in another county.

Sec 7. A member whose principal practice is moved from within the territorial limits of a component medical society to the territory of another component of the State Society shall inform the State Society of the change and the need to change his or her county medical society membership. After checking Wisconsin licensure, the State Society will inform both county societies of the change in membership. However, membership dues, if already paid, will stay with the original county. If not paid, the county where the physician is moving will receive the dues.

Sec 8. Rights and privileges of members whose principal practice is out of state.

A. Out-of-State Practice. When the principal practice of a member in good standing in a component society is moved outside the

borders of this state, membership in such component society and/or in the State Society may be continued by fulfilling all requirements of membership except residence. Members who choose to continue membership under this subsection shall have no voting rights nor hold office in the component society or in the State Society, but shall maintain all other membership benefits.

B. Part time In-State Practice. When the principal practice of a member in good standing in a component society is moved outside the borders of this state but who continues to practice less than part time as defined in Sec. 9.B.(1), within the state and who continues to fulfill all requirements of membership except residence, membership may be continued.

Sec 9. Membership classifications. Members defined in this section, except affiliates, shall have all the rights and privileges of the Society and shall pay dues and assessments, as indicated, as a requirement of continued membership.

A. Regular. Regular members of this Society consist of all the regular members in good standing who are also members of the applicable active component county societies.

B. Special. Included in this classification are the following categories of members who by virtue of their special circumstances are entitled to reduced dues or waiver thereof:

(1) Part-time practice. Except as provided in Section 8, any physician who practices part-time but does not qualify under section 9.B.(5), may upon application, recommendation by the applicable active county medical society, with reference to the Section 4 timeframe and approval by this Society, be placed in this special category.

(2) Resident. Physicians in approved training programs as hospital residents or as fellows who are licensed to practice medicine and surgery in Wisconsin.

(3) Associate. Members who suffer a disability preventing them from practicing medicine; members who are inducted into the United States Military or Public Health Service and serve in such capacity for not more than five (5) years; and members who take a leave of absence from practice to care for a sick family member or new child. Such membership shall be on an annual basis, upon recommendation of the State Medical Society Membership Committee.

(4) Retired. Members who have retired completely from the practice of medicine or any compensated position that requires a Wisconsin medical license, may upon application, recommendation by the applicable active county medical society with reference to the Section 4 timeframe and approval by this Society, be placed in this category.

(5) Life. Those members of the State Medical Society of Wisconsin who have been members of this or other state medical societies for fifty (50) years, or are past presidents of the State Medical Society of Wisconsin. They shall receive a certificate of Life Membership.

(6) Candidate. Upon application, a county medical society or this Society may confer upon any person then attending a medical school in Wisconsin or fulfilling a postgraduate obligation prior to eligibility for licensure the status of Candidate Member.

(7) Researcher. Members who work under an ACGME accredited institution whose primary source of income is research grants or at the discretion of the State Medical Society Membership Committee. Such special membership category can be maintained for a maximum of five (5) years.

C. Affiliate. Persons who are not otherwise eligible for membership may become affiliated with this Society in one of the following categories. Their dues or assessments, as well as rights and privileges as affiliate members, shall be determined by the Board.

(1) Scientific Fellow. The Board may by invitation and unanimous consent confer upon any person engaged in teaching of or research in one or more of the basic sciences at an accredited college or university, and not holding the degree of Doctor of Medicine or Osteopathy, the status of Scientific Fellow.

(2) Emeritus. Retired members who have chosen not to renew their license.

(3) Other. At its discretion, the Board of Directors may create other categories of Affiliate members.

Sec 10. Dues and Assessments. Members shall pay dues and assessments as follows:

A. Regular members: dues and assessments as determined annually by the House of Delegates.

B. Physicians in part-time practice: one-half of regular member dues and assessments.

C. Physicians in residency or fellowship training, Candidate and Researcher: dues and assessments are to be determined by the Board of Directors. Dues and assessments for all other categories shall be waived, except as may be determined by the Board for affiliate members.

Chapter II
House of Delegates

Section 1. Each component county society or, in counties with no active county medical society, the members whose principal places of practice are located within the geographic boundaries of the county, shall be entitled to send one delegate and

one alternate to the House of Delegates for each forty regular and special members or majority fraction thereof in this Society, provided, however, that each county society, or in counties with no active county medical society, the members whose principal places of practice are located within the geographic boundaries of the county, shall be entitled to at least one delegate and one alternate from that county society or county. For purposes of this section, the number of members as of the close of the calendar year preceding the first session of the House of Delegates at the Annual Meeting shall determine the number of delegates to which a county society or, in counties with no active county society, the membership in that county, shall be entitled. The secretary of each county society, or person designated by the membership of the county will send a list of such delegates and alternates to the executive vice president of this Society by the end of each calendar year preceding the year in which such delegates are elected to serve.

Sec 2. One-fourth of the members of the House of Delegates registered, representing one-fourth of the members holding memberships in county medical societies or, in counties with no active county medical society, the members whose principal places of practice are located within those counties in the state, shall constitute a quorum of the House of Delegates. All meetings of the House of Delegates shall be open to members of the Society.

Sec 3. The speaker shall preside at the meetings of the House of Delegates.

Sec 4. The vice speaker shall officiate for the speaker in the latter's absence or at his request. In case of death, resignation, or removal of the speaker, the vice speaker shall officiate during the unexpired term.

Sec 5. The speaker shall appoint members of reference committees from among the members of the House of Delegates. These committees shall consider and make recommendations to the House relative to resolutions, reports of officers, reports of commissions and committees, financial and other matters germane to the business of the House. The speaker shall also appoint a credentials committee and such other committees as deemed necessary.

Sec 6. The House of Delegates shall elect delegates to the House of Delegates of the American Medical Association in accordance with the Constitution and Bylaws of that body. No person who has served 12 or more consecutive years as a Wisconsin delegate to the AMA shall be eligible to serve another term unless the delegate will concurrently serve on any of the following American Medical Association Councils: Constitution and Bylaws, Medical Education, Medical Service, Ethical and Judicial Affairs, Long Range Planning and Development, Legislation, Scientific Affairs; or, the American Medical Political Action Committee Board of Directors.

Sec 7. The House of Delegates shall have authority to create committees for special purposes and to appoint members of the Society who need not be members of the House of Delegates. Such committees shall report to the House of Delegates, and their members may be present to participate in the debate on their reports.

Sec 8. It shall receive for appropriate action the annual reports of the treasurer, executive vice president, and chair of the Board of Directors.

Sec 9. Unanimous consent of the House of Delegates shall be required for the introduction of any new resolution or business not filed in proper form with the executive vice president's office of the Society two months before the first session of the House of Delegates. This section shall not apply to new business or resolutions presented by the Board of Directors or any member thereof, the constitutional officers, committees of the Society or of the House of Delegates, or officers of the House of Delegates.

Sec 10. All questions of an ethical nature brought before the House of Delegates shall be referred to the Board of Directors without discussion.

Chapter III
Annual Election

Section 1. The House of Delegates, at its first session of the annual meeting, shall elect a Committee on Nominations consisting of one (1) delegate for each district, except that in any district having five hundred (500) or more regular and special members, there shall be elected one (1) additional delegate for each additional five hundred (500) members or majority fraction thereof. One (1) delegate representing the specialty sections shall also be appointed. Nominating committee members shall be limited to six (6) consecutive terms. Those committee members who have served six (6) consecutive terms upon adjournment of the final session of the 1994 House of Delegates annual meeting and following years shall have met this requirement. This committee shall become operative at the close of the final session of that annual meeting and shall function until the close of the final session of the following year's Annual Meeting. The incoming committee shall meet with the existent committee but without vote during the overlapping days of the annual meeting. Any vacancy occurring in the Committee on Nominations between the date of its formation and the time of its reporting shall be filled by appointment by the director or directors of the district in which the vacancy occurs, or if a nominating committee member is unable to attend a nominating committee meeting or is a candidate for an office a substitute for that member shall be named by the most senior director available from the affected district by written notification to the executive vice president prior to the meeting of the nominating committee, provided that if the vacancy or need for substitution occurs in the representation from the specialty sections, such vacancy or substitution shall be filled by ballot from among the section delegates. The Committee on Nominations shall convene at least two (2) months prior to the annual meeting of the House of Delegates to prepare a slate of candidates. This meeting, to be held at a time, date and location published to the general membership at least two (2) months before this meeting, shall include an open

session of not less than one (1) hour to allow individual nomination of candidates. The Committee shall report the result of its deliberations to the House of Delegates in the form of a ticket containing the name of the Board nominee for treasurer and the names of one or more members for each of the other positions to be filled.

Sec 2. The report of the Committee on Nominations and elections shall be the first order of business of the House of Delegates at the third session of the annual meeting.

Sec 3. The House of Delegates shall elect the president-elect, the treasurer, the speaker and vice speaker of the House of Delegates, and the delegates and alternates to the American Medical Association. Where there is no contest, a majority vote without ballot shall elect. All other elections shall be by separate ballot for each individual position, and a majority of the votes cast shall be necessary to elect. If no nominee receives a majority of the votes on the first ballot, the nominee receiving the lowest number of votes shall be dropped, except where there is a tie, and a new ballot taken. This procedure shall be continued until one of the nominees receives a majority of the votes cast.

Sec 4. Nothing in this chapter shall be construed to prevent additional nominations being made from the floor by members of the House of Delegates.

Chapter IV
Duties of Officers

Section 1. The president is the chief constitutional officer of the Society. Within the limits of the Constitution, Bylaws, and policies of the House of Delegates and Board of Directors, the president shall have the following responsibilities and commensurate authority:

a. deliver an annual address to the House;
b. serve as a member with right to vote on the Board;
c. preside at meetings of the Executive Committee of the Board;
d. participate, ex officio and without the right to vote, in sessions of the House;
e. initiate and propose policies and programs that will further the goals and objectives of the Society for consideration by the House, Board, commissions and committees;
f. support and articulate policies and programs adopted by the Board and the House.
g. promote physician interest and active participation in the Society.

Sec 2. The president-elect shall act for the president in his absence or disability. If the office of president should become vacant, the president-elect shall succeed to the presidency. In case of vacancy in the office of both president and president-elect, the Board shall appoint one of its members as acting president until the next meeting of the House of Delegates.

Sec 3. The treasurer shall be responsible to the Board of Directors, and shall advise and assist it in making decisions on investment policy and financial matters. The duties of the treasurer shall include the following:

a. Be responsible for all funds due the Society, together with bequests and donations;
b. Pay money out of the treasury only on written order of the secretary;
c. Subject the treasurer's accounts to such examination as the House of Delegates may order;
d. Annually report on the financial standing of the Society, including a balance sheet and income and expense report;
e. Give bond in such amount as the Board may provide.
f. Serves as chair of the Finance Committee of the Board.

Sec 4. The executive vice president is the chief executive officer of the Society charged with the execution of policy as created and defined by the House of Delegates and the Board of Directors. The executive vice president shall serve as an ex officio, nonvoting member of the Board; be responsible to the Board and serve as its secretary; assist the Board and officers in making decisions and implementing actions; share convictions and argue their merits; perform the functions ordinarily assigned to the office of executive vice president, and make an annual report to the House of Delegates. "As chief executive officer the executive vice president shall, within the limits of the Constitution and Bylaws and Board operating policies, effectively perform the general managerial function for the Society and all of its divisions, activities, and personnel including employment and, as necessary, termination of all employees; be responsible for and have the necessary authority to direct, supervise, and coordinate all programs, projects and major activities of the Society and all wholly owned subsidiaries; formulate and recommend for approval of the Board basic policies and programs which will seek to achieve the objectives and goals of the Society; fully inform the Board on the condition and operation of the association; cooperate with the Board and Treasurer in establishing a program of fiscal responsibility for the Society including development, recommendation and upon approval, operation within an annual budget; act to insure that all funds, physical assets, and other property of the Society are appropriately safeguarded and administered; develop and maintain effective internal and external communications with the membership and other organizations and agencies, both public and private, so as to enhance the positions of the Society and the objectives of its membership; and through effective management and leadership, achieve economic, productive performance, forward-looking programming, and constructive growth of the Society."

Note: Following adoption of this Bylaw change (Sec. 4 above) in 1987, the Board agreed to develop and maintain a set of current "operating policies" between itself and the secretary to detail the more specific duties and expectations important to a good working relationship between the Board and the secretary.

Chapter V
Board of Directors

Section 1. The Board of Directors shall be the executive body of the Society. Between meetings of the House of Delegates it shall exercise the power conferred on the House of Delegates by the Constitution and Bylaws.

Sec 2. The Board shall meet during the annual meeting and at such other times as necessity may require, subject to the call of the chairman or on petition of three directors. It shall hold an annual meeting for purposes of organization and other business.

Sec 3. The Board shall elect a chairman and a vice chairman from among its voting members. It may create such further offices or combine or abolish them as it sees fit in the management of its affairs and in the discharge of its responsibilities. Its chairman shall submit an annual report to the House of Delegates including all major actions and policy decisions of the preceding year.

Sec 4. Each district director shall be the organizer and mediator for the district. District directors shall visit each county in their district as needed for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession, and to keep informed of the activities of the component societies in the district. Each district director shall arrange for an annual conference or caucus with the societies or their delegates within the district or, in counties with no active county medical society, with the members whose principal places of practice are located within the geographic boundaries of the counties in the district, at which time information shall be disseminated concerning the activities of the State Medical Society and component societies within the district. Each district director and the resident physician director shall report as necessary to the Board. The necessary traveling expenses incurred by each director in the line of duties herein imposed may be allowed on a proper itemized statement, but this shall not be construed to include the expense of attending the annual meeting of the Society.

Sec 5. The Board of Directors shall be the judicial body of the Society. It may decide any questions of conduct or discipline of members, or any questions involving the rights and standing of members, whether in relation to other members, to the component societies, or to this Society. It shall develop and publish procedures for discipline, including denial of initial or continuing membership, for those physicians who fail to provide quality health care, failure to pay dues, loss of license to practice, or other cause. Its decisions in all cases shall be final, including the right to expel a member. The Board's right to original jurisdiction includes but is not limited to the right to decide cases when:

a. the affected parties reside within the boundaries of a single county medical society, are members of the county medical society, and that society does not wish to assume jurisdiction;
b. the affected parties reside in two or more component medical society jurisdictions or counties. The Board also has within its authority the right to appoint a commission or commissions to which any or all such matters may be referred for investigation, evaluation and decision to acquit, admonish, or otherwise discipline as appropriate. A member may appeal to the Board the decision of such commission or the action of a county society as provided in Chapter X, Section 3. If the recommendation is for suspension or expulsion of a physician from Society membership, final action must be taken by the Board.

Sec 6. Charters shall be issued to county societies only on approval of the Board, with ratification by the House of Delegates, and shall be signed by the president and executive vice president of this Society. Upon the recommendation of the Board, the House of Delegates may revoke the charter of any component society whose actions are in conflict with the letter or spirit of this Constitution and Bylaws.

Sec 7. In sparsely settled sections, the Board shall have authority to organize the physicians of two or more counties into societies. These societies, when organized and chartered, shall be entitled to all rights and privileges provided for component societies until such counties shall be organized separately.

Sec 8. The Board shall provide for and superintend the issuance of all publications of the Society including proceedings, transactions and memoirs, and shall have the authority to appoint an editor of the Journal and such assistants as it deems necessary.

Sec 9. The Board shall select a qualified independent accounting firm and receive an annual audit of all accounts of this Society. With the treasurer, it shall supervise the investment of funds. The Board shall adopt an annual budget providing for the necessary expenses of the Society.

Sec 10. The Board may, by interim appointment, fill any vacancy in office not otherwise provided for which may occur during the interval between annual meetings of the House of Delegates, except a vacancy in the remainder of the term of the resident physician director shall be filled only by appointment by the chair of the resident physician section of the Society. The appointee shall serve until a successor has been elected and has qualified. When a district initially qualified for an additional director, such position shall be considered new and not a vacancy to which the Board is authorized to make an interim appointment. Such new position shall be filled by election at the next meeting of the House of Delegates in the manner provided by Article VI of the Constitution. The initial term shall be so established as to maintain the election of substantially one-third of the district directors each year.

Sec 11. The Board may elect as executive vice president one who need not be a physician or a member of the Society.

Sec 12. The Board shall provide such facilities for the Society as may be required to properly conduct its business.

Sec 13. The Board shall nominate a director to serve as treasurer and shall report the nominee to the

Committee on Nominations in the manner provided by Chapter III of the bylaws.

Sec 14. There shall be an Executive Committee of the Board which shall consist of the president, the president-elect, the immediate past president, the chair and vice chair of the Board, the chair of the Finance Committee, the speaker, and two additional district directors to be appointed annually by the chair of the Board. The Alliance president and president-elect shall be ex-officio non-voting members. The Executive Committee shall possess and may exercise all the powers of the Board of Directors between meetings of the Board. The Executive Committee shall meet prior to the meetings of the Board and at such other times as may be required, subject to the call of the chair or on petition of three voting members, and shall report all actions taken by it to the next meeting of the Board, for its consideration.

Chapter VI
Commissions and Committees

Section 1. The Board shall appoint such commissions and committees, either permanent or ad hoc, as it deems necessary to properly conduct the affairs of the Society. Membership on such committees and commissions shall be limited to members of the Society and its Alliance. Nonmembers of the Society or its Alliance may be appointed as special representatives should their expertise and knowledge be of benefit to the goals of such commissions or committees. Such individuals shall not have the right to vote or hold office, except special representatives appointed to the Commission on the Center for Medical Practice Research and Education shall have the right to vote. Each commission and committee shall have the duty of being informed on matters within the area of its special interest. They shall represent the Society's interests by continual contacts with voluntary and governmental agencies having related concerns with the intention of coordinating efforts to serve the health interests of the people of Wisconsin. They shall develop recommendations from their studies and activities for action by the Board or House of Delegates.

Sec 2. Specialty sections shall be regarded as special committees of the Society from which the Board or any commission or committee may seek advice and assistance on matters of special or general concern to the profession and the health of the people of Wisconsin. The specialty sections will be expected to give special requests prompt consideration and response so as to enable the Society to make maximum use of their resources.

Chapter VII
Dues and Assessments

Section 1. The annual dues and assessments of this Society shall be determined by the House of Delegates and shall be levied per capita on the members. Dues and assessments shall be payable as determined by the Board of Directors. Any member whose current year's dues have not been received by the executive vice president on or before the dues payment deadline, as established by the Board of Directors, shall be deemed in arrears and shall be removed from the membership rolls of this Society and as applicable, the county society until such time as full dues for the current year have been received.

Sec 2. The record of payment of dues and assessments on file in the offices of this Society shall be final as to the fact of payment by a member and to the right to participate in the business and proceedings of the Society or the House of Delegates and to any other benefits and privileges of membership.

Chapter VIII

The Board of Directors shall adopt ethical guidelines for the members of this Society.

Comment: On July 18, 1981 the Board of Directors adopted the Principles of Medical Ethics of the AMA as the ethical guidelines of the Society.

Chapter IX

The current edition of Sturgis Standard Code of Parliamentary Procedure governs this organization in all parliamentary situations that are not provided for in the law or in its charter, constitution, bylaws, or adopted rules.

Chapter X
County Societies

Section 1. All present county societies or those that may hereafter be organized in this state shall, upon application to the Board of Directors, receive charters from this Society, provided that their constitutions and bylaws have been submitted to the Board and found in conformity with the Constitution and Bylaws of the State Medical Society. All revisions shall be submitted to the Society, approved by the Board, and filed with the executive vice president. Where a county society has lost or misplaced its constitution and bylaws, the model constitution and bylaws for county medical societies, as last approved by the Board, shall be deemed to apply.

Sec 2. Only one component medical society shall be chartered in each county.

Sec 3. Any physician who may feel aggrieved by the action of the society of his county in suspending or expelling him shall have the right to appeal to the Board of Directors of the State Society. Its decision shall be final. A county society shall at all times be permitted to appeal or refer questions involving membership to the Board of the State Society for final determination. The mechanisms and procedures which apply to the appeal process shall be those adopted by the Board.

Sec 4. The members of this Society who are also members of a component county society, or in counties with no active county medical society, the members whose principal places of practice are located within the geographic boundaries of the county, shall elect one or more delegates and may elect an equal number of alternates to substitute for any absent delegates from that component society or county, for a term of two calendar years, to represent it in the

House of Delegates of this Society, in accordance with Chapter II, Section 1, of these Bylaws. The term of office shall begin on January 1 of the year succeeding the election of such delegates and alternates.

Sec 5. The secretary of each county society or, in counties with no active county medical society, the person appointed by the members whose principal places of practice are located within the geographic boundaries of that county, shall keep a roster of its members.

Sec 6. The SMS Board may consider no more than once per calendar year a written request by at least 10% of the regular and special members of a county medical society to hold a mail ballot to retire the county society to inactive status. The SMS Board shall make a determination based upon established Board policy whether such a ballot shall be conducted. If the Board approves, a ballot shall be sent by the State Society to all regular and special members of that county society. At least 25% of these ballots must be returned to the State Society's executive vice president, and a simple majority of the returned ballots is necessary before the SMS Board will review the results and take appropriate action to change the status of the county medical society.

Chapter XI
Specialty Sections

Section 1. The House of Delegates shall establish specialty and special sections within the Society. It shall have the power to combine, enlarge, or discontinue any or all of such sections so established using the following guidelines:

a. For specialty section to be designated it must represent a specialty which is represented in the American Medical Association House of Delegates and
b. Have at least twenty (20) members of the specialty who are members of this Society.
c. If no representative from the specialty section registers as a representative of that section for three (3) consecutive annual meetings, the specialty section will be dropped with the option of reapplying after one year, provided the above criteria are met.
d. From time to time special sections not meeting the above criteria may be established by the House of Delegates.

Sec 2. Such sections so established shall be based upon those divisions of medicine in which the various members possess a special interest. Qualifications for membership in any section shall be established by the members of such section, subject to approval of the Board of Directors, Scientific meetings of a section shall be open to all members in good standing of the State Medical Society.

Sec 3. The officers of each section shall be elected by and from its membership. The terms of such officers shall be for one year, but any officer may be reelected.

Sec 4. No section shall have the power to bind the State Medical Society by any resolution or other action. No such resolution or action shall be publicized unless it shall first have been approved by the House of Delegates, or by a majority of the Board when the House is not in session. No resolution adopted by any section shall be effective until likewise so approved.

Sec 5. Each section, except the two medical student special sections, shall elect a delegate and an alternate to the House of Delegates. The term shall be for two calendar years without limitation on number of terms.

Sec 6. There shall be two special sections for medical student members of the Society, one representing the University of Wisconsin and one representing the Medical College of Wisconsin, which shall each be entitled to elect one delegate and one alternate to the House of Delegates for each forty candidate members or majority fraction thereof in this Society determined as of the close of the calendar year preceding the first session of the House of Delegates Annual Meeting, provided, however, that these sections shall each be entitled to at least one delegate and one alternate. The term shall be for one calendar year without limitation on number of terms.

Sec 7. The resident physician section shall be entitled to elect one section member, for a term of one year not to exceed four terms, as the resident physician director to the Board of Directors.

Sec 8. The specialty sections of the Society shall be considered an integral part of the working committee structure of the Society as outlined in Chapter VI of these Bylaws.

Chapter XII
Amendments

These Bylaws may be amended at any annual meeting by a majority vote of the delegates present, if the proposed amendment has been properly submitted to the House of Delegates and has laid over for one session of that annual meeting.

SMS Councils and Task Forces

The following is a list of SMS councils and task forces, and their members for 2000–2001. The original year of each member's appointment, as well as the expiration of his or her term, at the annual meeting of the year designated appears with each member's name.

Chairs of councils are appointed for one-year terms by the Board of Directors. Vice chairs are elected at the first meeting of each council following the annual meeting. This issue of the *WMJ* is prepared prior to most of these elections; therefore, some councils will not include these designations.

Ethics and Judicial Affairs

This council shall be concerned with the ethical aspects of medical practice in order to permit discussion of common problems in the total treatment and care of patients; and, to clarify the relationship between ethics and science in medicine.

Donald R. Beaver, DO, Wauwatosa, 1992/1998-2001
Steven H. Cohen, MD, Milwaukee, 1993/1998-2001
Wm. Michael Cross, MD, Green Bay, 1992/1998-2001
Timothy J. O'Neil, MD, Columbus, 2000/2000-2001
Richard J. Thurrell, MD, Madison, 1990/1998-2001
Henry M. Waldren Jr., MD, Oconomowoc, 1995/1998-2001
Richard A. Dart, MD, Marshfield, 1993/1999-2002, chair
Michael G. Deeken, MD, Milwaukee, 2000/2000-2002
Mary H. Frantz, MD, Monroe, 1995/1999-2002
Kay A. Heggestad, MD, Madison, 2000/2000-2002
Robert E. Holzgrafe, MD, Waukesha, 1995/1999-2002
G. Daniel Miller, MD, Dousman, 1996/1999-2002
Jonathan H. Berkoff, MD, Milwaukee, 1997/2000-2003, vice chair
Sean F. Buckley, MD, Madison, 2000/2000-2003
Jeffrey E. Grossman, MD, Madison, 2000/2000-2003
William J. Hisgen, MD, Madison, 1995/2000-2003
Kirk J. Hogan, MD, Madison, 2000/2000-2003
Paul V. Tuttle III, MD, Sheboygan, 2000/2000-2003
Stephen B. Webster, MD, La Crosse, 2000/2000-2003
Jane Sybesma, Fond du Lac, Alliance
Staff support: Merry Earll

Legislation

This council shall plan, organize and implement programs to protect and preserve the legislative, socioeconomic, and political interests of the members of the State Medical Society of Wisconsin. The council shall analyze state and federal legislation and administrative rules and policies, and recommend to the Board of Directors specific actions and positions designed to carry out this responsibility. The council shall also inform the membership of the Society regarding proposed legislation and other public policy initiatives, seek the enactment of legislation for the best interests of the public, scientific medicine, and the medical profession, and promote and encourage Society members to be politically active individually and collectively. This council shall act to protect the socioeconomic interests of the Society membership in public and private health care delivery systems and recommend to the Board of Directors specific strategies and efforts to achieve this purpose. This council shall consist of members appointed by the Board of Directors in a number deemed sufficient to execute the responsibilities delegated to the council. Membership on the council shall also include a representative from each of the specialty sections of the Society, subject to approval by the Board of Directors. These representatives shall be appointed by the sections annually, and shall have the right to vote on all matters before the council. The President, President-elect, Immediate Past President, and Chairman of the Board of the Society shall serve as ex officio members of the council with vote.

Gary L. Bryant, MD, La Crosse, 1993/1998-2001
Clarence P. Chou, MD, Wauwatosa, 1998/1998-2001
Carleton B. Davis Jr., MD, Monroe, 1998/1998-2001
John J. Eversman, MD, Milwaukee, 1998/1998-2001
William E. Raduege, MD, Woodruff, 1995/1998-2001
Daniel R. Sherry, MD, Ellsworth, 1998/1998-2001
Mark A. Timm, MD, Menomonee Falls, 1995/1998-2001
Laurens D. Young, MD, Milwaukee, 1995/1998-2001
George C. Yu, MD, Milwaukee, 1998/1998-2001
Edward J. Dunn, MD, Milwaukee, 1997/1999-2002
Carl S.L. Eisenberg, MD, Milwaukee, 1996/1999-2002
Kae L. Ferber, MD, Madison, 1998/1999-2002
Jeffrey D. Larsen, MD, River Falls, 1997/1999-2002
Lisa C. Ramsay, MD, Racine, 1999/1999-2002
Frank J. Salvi, MD, Cottage Grove, 1999/1999-2002

Clark W. Stevens, MD, Green Bay, 1999/1999-2002
Brian R. Woody, MD, Viroqua, 1999/1999-2002
Gregg A. Bogost, MD, Madison, 2000/2000-2003
Lowell H. Keppel, MD, Milwaukee, 1998/2000-2003
Kevin V. Moss, MD, Milwaukee, 2000/2000-2003
John F. Pope, MD, Wauwatosa, 1994/2000-2003
Evan K. Saunders, MD, Milwaukee, 1995/2000-2003
Michael R. Seitzinger, MD, Berlin, 1997/2000-2003
Thomas Slota, MD, Milwaukee, 1992/2000-2003
Sridhar V. Vasudevan, MD, Brookfield, 1994/2000-2003, chair
Sharon Larson, Waupaca, WMGMA representative
Linda Minnihan, Wausau, Alliance

President: Ayaz M. Samadani, MD, Beaver Dam
President-elect: Raymond C. Zastrow, Milwaukee
Immediate Past President: Jack M. Lockhart, MD, La Crosse
Chair of the Board: Mark H. Andrew, MD, Viroqua

Section representatives
Allergy Section: Todd A. Mahr, MD, Onalaska
Anesthesiology Section: John F. Kreul, MD, Madison
Cardiology Section: Vacant
Dermatology Section: Eric R. Berg, MD, Madison, vice chair
Emergency Medicine Section: Thomas J. Luetzow, MD, Watertown
Family Physicians Section: Calvin S. Bruce, MD, Madison
Internal Medicine Section: Susan L. Turney, MD, Marshfield
International Medical Graduate Section: Kesavan Kutty, MD, Milwaukee
Medical Students – MCW Section: Jeffrey Huebner, Wauwatosa
Neurosurgery Section: Mohammed Rafiullah, MD, Racine
Obstetrics-Gynecology Section: Joel B. Henry, MD, Janesville
Ophthalmology Section: Charlotte Burns, MD, Middleton
Organized Medical Staff Section: Edward R. Winga, MD, La Crosse
Orthopedic Section: Robert O. Buss, MD, Brookfield
Otolaryngology Section: Steven K. Dankle, MD, Milwaukee
Pathology Section: Katherine M. Bayliss, MD, Waukesha
Pediatrics Section: Donald C. Burandt, MD, Beloit
Physical Medicine and Rehabilitation Section: Robert M. Stern, MD, Mequon
Preventive Medicine Section: Sidney Shindell, MD, Milwaukee
Psychiatric Section: Richard J. Thurrell, MD, Madison
Radiation Oncology Section: Richard A. Steeves, MD, Madison
Radiology Section: Timothy T. Flaherty, MD, Neenah
Resident Physician Section: Tosha B. Wetterneck, MD, Madison
Surgery Section: Ronald D. Wenger, MD, Madison
Thoracic Medicine Section: Edward R. Winga, MD, La Crosse
Urology Section: Bruce M. Neal, MD, Green Bay, and Robert E. Vlach, MD, Appleton
Young Physicians Section: Evan K. Saunders, MD, Milwaukee
(Other Section Representatives to be appointed)

Staff support: Alice O'Connor/Eric Jensen

Health Care Access and Financing

The mission is to advance, advocate and advise on health care access, financing and delivery, risk management, liability reduction and workers compensation issues so that the State Medical Society may advance the health of the people of Wisconsin.

Al Baltrusaitis, DO, Brookfield, 1995/1998-2001
Kathleen M. Broad, MD, Superior, 1998/1998-2001
Joseph C. DiRaimondo, MD, Manitowoc, 1990/1998-2001
Kerry L. Drain, MD, Milwaukee, 1998/1998-2001
Reynaldo P. Gabriel, MD, Cudahy, 1998/1998-2001
Peter J. Holzhauer, MD, Brookfield, 1993/1998-2001
Daniel L. Icenogle, MD, Verona, 1998/1998-2001
Bruce A. Kraus, MD, Columbus, 1997/1998-2001, chair
Harry Prosen, MD, Milwaukee, 1994/1998-2001
Thomas A. Reminga, MD, Mequon, 1998/1998-2001
Beatriz Somoza, MD, Portage, 1998/1998-2001
E. Robert Taake, MD, Green Bay, 1998/1998-2001
Tuenis D. Zondag, MD, Eau Claire, 1994/1998-2001
Steven R. Baker, MD, Milwaukee, 1999/1999-2002
Clarence P. Chou, MD, Mequon, 1999/1999-2002, vice chair
Edward J. Coleman, MD, Green Bay, 1992/1999-2002
Daniel D. Gilman, DO, Milwaukee, 1993/1999-2002
Norman M. Jensen, MD, Madison, 1999/1999-2002
Sidney E. Johnson, MD, Marshfield, 1999/1999-2002
Kenneth M. Klatt, MD, Madison, 1993/1999-2002
David J. Kuester, MD, Manitowoc, 1999/1999-2002
Craig Larson, MD, Milwaukee, 1996/1999-2002
Bradley L. Manning, MD, Madison, 1995/1999-2002
Nancy Ness, MD, Mauston, 1999/1999-2002
John R. Petersen, MD, Wauwatosa, 1994/1999-2002
Charles W. Schauberger, MD, La Crosse, 1993/1999-2002, vice chair
Richard M. Carr, MD, Madison, 2000/2000-2003
Donald L. Feinsilver, MD, West Allis, 1994/2000-2003
David A. Goodman, MD, Madison, 1998/2000-2003
Christal A. Gordon, MD, Whitewater, 1997/2000-2003
Charles V. Ihle, MD, Eau Claire, 1992/2000-2003
Mark A. Kaufman, MD, Madison, 2000/2000-2003
Raymond B. Laravuso, MD, Madison, 1998/2000-2003
Peter D. Rumm, MD, Madison, 2000/2000-2003
Mark K. Stevens, MD, La Crosse, 1997/2000-2003
Susan L. Turney, MD, Marshfield, 1995/2000-2003
Laurens D. Young, MD, Milwaukee, 1993/2000-2003
Jean Larson, medical student, UW
Sarang Baman, MD, resident, MCW
Staff support: Erin Warner/Merry Earll

Health of the Public

The council shall provide leadership, in collaboration with others, for policy development, and physician and public education on public and preventive health initiatives in order for the State Medical Society to advance the health of the people of Wisconsin.

Henry A. Anderson, MD, Madison, 1992/1998-2001
Arthur E. Angove, DO, Milwaukee, 1995/1998-2001
Mark R. Aschliman, MD, Milwaukee, 1998/1998-2001
Michelle L. Bachhuber, MD, Marshfield, 1993/1998-2001, chair
Frederick W. Blancke, MD, Madison, 1998/1998-2001
Joseph N. Blustein, MD, Madison, 1992/1998-2001
Fredrik F. Broekhuizen, MD, Whitefish Bay, 1995/1998-2001
Stephen W. Hargarten, MD, Milwaukee, 1995/1998-2001, vice chair
Christopher Johnson, MD, Fond du Lac, 1998/1998-2001
Paul R. Myers, MD, Neenah, 1992/1998-2001
Michael G. O'Mara, Oconomowoc, 1994/1998-2001
Susan K. Kinast-Porter, MD, Monroe, 1995/1998-2001
Laurel A. Rudolph, MD, Marshfield, 1998/1998-2001
Edward P. Callahan, MD, Janesville, 1996/1999-2002
Vernon N. Dodson, MD, Madison, 1999/1999-2002
David K. Falk, MD, Madison, 1998/1999-2002
Jean Ricci Goodman, MD, Marshfield, 1993/1999-2002
Phiroze L. Hansotia, MD, Marshfield, 1992/1999-2002
Perry A. Henderson, MD, Madison, 1999/1999-2002
Robert J. Jaeger, MD, Stevens Point, 1994/1999-2002
Stanley A. Korducki, MD, Milwaukee, 1999/1999-2002
Paul R. Meier, MD, Marshfield, 1999/1999-2002
Cynthia L. Jones-Nosacek, MD, Milwaukee, 1993/1999-2002
Robert E. Phillips, MD, Marshfield, 1993/1999-2002
Thomas N. Saari, MD, Madison, 1999/1999-2002
William R. Scorby, MD, Onalaska, 1999/1999-2002
Patricia J. Stuff, MD, Bonduel, 1998/1999-2002
E. Howard Theis, MD, Fond du Lac, 1999/1999-2002
Alison S. Wilmeth, MD, Belleville, 1996/1999-2002
Andrea L. Winthrop, MD, Milwaukee, 1999/1999-2002
Debra A. Zillmer, MD, Onalaska, 1999/1999-2002
Richard Aronson, MD, Madison, 2000/2000-2003
David L. Drury, MD, Whitefish Bay, 1994/2000-2003
Bernard F. Micke, MD, Madison, 1994/2000-2003
Judith D. Pruski, MD, Fond du Lac, 1994/2000-2003
Lucille B. Glicklich-Rosenberg, MD, Milwaukee, 1998/2000-2003
Patrick Remington, MD, Madison, 2000/2000-2003
William E. Scheckler, MD, Madison, 1999/2000-2003
Dennis Schultz, MD, Franklin, 2000/2000-2003
Joanne A. Selkurt, MD, Whitehall, 1994/2000-2003
Sidney Shindell, MD, Milwaukee, 2000/2000-2003
Barry I. Spiegel, DO, Janesville, 1997/2000-2003
Linda Minnihan, Wausau, Alliance
Daniel Ries, medical student, UW
Rachel Wierzba, medical student, UW
Kawasar Talaat, MD, resident, MCW
Staff support: Lynn Sherman/Merry Earll

Mediation and Peer Review

This council shall receive, investigate, and seek to resolve differences between physicians and patients or other complainants, or between physicians, on matters relating to quality of care, and professional ethics. When necessary, it shall initiate disciplinary or other action as appropriate. It shall serve as the Society's advisory body to private or governmental organizations on matters affecting medical peer review, including utilization review, appropriateness of care and quality assurance. It shall advise and consult with component societies on issues of peer review, mediation, ethics, and discipline in concert with members of the Board of Directors. It shall serve as the initial appellate body for peer review and mediation issues that are appealed from local committees of component societies. It shall coordinate the Statewide Physician Health Program. *(See related article on page 34.)*

Randi W. Hart, MD, Waukesha, 1999/1999-2001
Kenneth O. Johnson, MD, Oconomowoc, 1992/1998-2001
Keith MacGaffey, MD, Menomonee Falls, 1998/1998-2001
Arthur Plautz, MD, Janesville, 1998/1998-2001, chair
Donald F. Weber, MD, Eau Claire, 1992/1998-2001
John B. Weeth, MD, La Crosse, 1992/1998-2001
Michael H. Gilman, DO, Milwaukee, 1994/1999-2002
Todd R. Hendrickson, MD, Antigo, 1996/1999-2002
William J. Henry, MD, Wisconsin Rapids, 1996/1999-2002, vice chair
Martin L. Lobel, MD, Milwaukee, 1993/1999-2002
N. Muni Reddy, MD, Wauwatosa, 1996/1999-2002
Gregory J. Schmeling, MD, Milwaukee, 1996/1999-2002
Manfred C. Chiang, MD, Brookfield, 2000/2000-2003
Victor S. Ejercito, MD, Marshfield, 2000/2000-2003
Lucille B. Glicklich-Rosenberg, MD, Milwaukee, 1994/2000-2003
Carol J. Uebelacker, MD, Delafield, 2000/2000-2003
William A. Wood, MD, Madison, 1994/2000-2003
Virgil L. Sharp, DO, Waterloo, representing the Wisconsin Association of Osteopathic Physicians and Surgeons
Staff support: Mark Adams/Sonia Porter

Coordinating Council on Physician Impairment

William J. Listwan, MD, West Bend (SMS)
Fred H. Koenecke Jr., MD, Richland Center (SMS)
Mikki Paterson, Madison, public member (MEB)
Ronald Grossman, MD, River Hills (MEB)

Glenn Hoberg, DO, River Falls (MEB)
Barry I. Spiegel, DO, Janesville (SMS)
Staff support: John LaBissoniere/Sonia Porter

Managing Committee, Statewide Physician Health Program

Fred H. Koenecke Jr., MD, Richland Center
William J. Listwan, MD, West Bend, chair
William E. Martens, MD, Wauwatosa
H. Marshall Matthews, MD, Sheboygan
Julie K. Nielsen, MD, Madison
Sandra L. Osborn, MD, Verona
Rebecca D.C. Perry, MD, Crandon
Barry I. Spiegel, DO, Janesville
Medical Director, Statewide Physician Health Program
David G. Benzer, DO, Blair
Staff support: John LaBissoniere/Sonia Porter

Medicaid Medical Audit

Richard M. Carr, MD, Madison
Gregg A. Bogost, MD, Madison
John A. DeGiovanni, MD, Prairie du Sac
Richard W. Edwards, MD, Richland Center
Charles S. Geiger Jr., MD, West Bend, chair
Michael H. Gilman, DO, Glendale
Thomas J. Gvora, MD, Menomonee Falls
D. Mark Lochner, MD, Waupaca
David A. Satchell, MD, Manitowoc
Virgil L. Sharp, DO, Waterloo, representing the Wisconsin Association of Osteopathic Physicians and Surgeons
Daniel W. Shea, MD, De Pere
Staff support: John LaBissoniere/Sonia Porter

Medical Education

This council shall consist of up to 20 appointed members and the deans of the two medical schools in Wisconsin, or their designees, with vote. It shall be responsible for all matters relating to the whole continuum of medical education, i.e., medical school and residency training as well as lifetime medical learning (continuing medical education). In addition, it shall be responsible for liaison with the medical schools in Wisconsin, their students, residents, fellows and departments of continuing medical education; liaison with specialty societies in the achievement of these goals; liaison with the Council on Mediation and Peer Review and the Ad Hoc Committee on Health Planning for purposes of implementing continuing medical education programs related to responsibilities and activities of these two groups; and ongoing scientific programs of the State Medical Society. It shall be responsible for accreditation of continuing medical education in hospitals and other institutions or organizations within the state, but shall not be responsible for accreditation of continuing medical education within the state's medical schools. *(See related article on page 35.)*

Jan P. De Roos, MD, Sheboygan, 1995/1998-2001
Vernon N. Dodson, MD, Madison, 1992/1998-2001
Kesavan Kutty, MD, Milwaukee, 1993/1998-2001, vice chair
Richard P. Day, MD, Madison, 1993/1999-2002, chair
Robert H. Fisher, MD, Menomonee Falls, 1997/1999-2002
Thomas C. Meyer, MD, Madison, 1996/1999-2002
Pontus G. Ostman, MD, Fond du Lac, 1996/1999-2002
John W. Beasley, MD, Madison, 2000/2000-2003
Patricia F. Harris, MD, Madison, 1997/2000-2003
Charles E. Holmburg, MD, Menomonee Falls, 1994/2000-2003
E. Barclay Schultz, MD, Prairie du Sac, 2000/2000-2003
Medical School Deans' designees: George C. Mejicano, MD, UW Medical School; Michael D. O'Donnell, Medical College of Wisconsin
Staff support: Karen Carney/Elaine Stern

Medical Practice Research and Education

The purpose of the council is to conduct activities and programs addressing issues that impact the measurement and improvement in health care quality through research and education. Council programs and activities may include, but are not limited to, medical research regarding effectiveness, efficacy and efficiency of medical care; quality assessment and improvement programs; quality of care benchmarking; physician and medical group accreditation; and other related activities.

Kevin T. Flaherty, MD, Wausau, 1998/1998-2001
Norman W. Hoover, MD, Milwaukee, 1998/1998-2001
Sandra L. Osborn, MD, Verona, 1998/1998-2001
John R. Petersen, MD, Wauwatosa, 1998/1998-2001
Ayaz M. Samadani, MD, Beaver Dam, 1998/1998-2001
Jerry M. Ingalls, MD, Monticello, 1998/2000-2003, chair
Special Representative: Susan Manning, JD, RRA, Madison
Staff support: Cindy Helstad/David Salo

Medical Practice Research and Education Liaison Committee

Kevin T. Flaherty, MD, Wausau, 1998/1998-2001
Norman W. Hoover, MD, Milwaukee, 1998/1998-2001
Sandra L. Osborn, MD, Verona, 1998/1998-2001
John R. Petersen, MD, Wauwatosa, 1998/1998-2001
Patrick L. Remington, MD, Madison, 1998/1998-2001

Ayaz M. Samadani, MD, Beaver Dam, 1998/1998-2001
Richard H. Christenson, MD, Milwaukee, 1998/1999-2002
Thomas A. Reminga, MD, Mequon, 1998/1999-2002
Peter A. Sanderson, MD, Plover, 1998/1999-2002
Maxwell H. Weingarten, MD, Milwaukee, 1998/1999-2002
Jerry M. Ingalls, MD, Monticello, 1998/2000-2003, chair
David R. Weber, MD, Fond du Lac, 1998/2000-2003

Special Representatives
Jan Haedt, RN, Madison
Barbara Rudolph, PhD, Madison
Jean Sesing, RN, Waukesha
Janice Smith-Pigg, BSN, MS, Cedarburg
Sally Zimmerman, Manitowoc
Staff support: Cindy Helstad/David Salo

Wisconsin Medical Journal (*WMJ*)

WMJ shall be the official journal of the Society. An editorial board consisting of the medical editor as chair and no less than six additional members shall be responsible for all scientific, editorial, and business affairs of the *WMJ*. An editorial director, serving as chair of a group of no less than five editorial associates, shall be responsible for regularly providing items of editorial opinion for publication in the editorial pages of *WMJ*.

Kenneth T. Bastin, MD, Milwaukee, 1998/1998-2001
Manuel A. Mendoza, MD, Sun Prairie, 1999/1999-2001
Thomas C. Meyer, MD, Madison, 1995/1998-2001, chair and medical editor
Marc S. Williams, MD, La Crosse, 1998/1998-2001
Donald R. Gore, MD, Sheboygan, 1998/1999-2002
Kesavan Kutty, MD, Milwaukee, 1994/1999-2002
Katherine R. Stevenson, MD, Milwaukee, 1999/1999-2002
John D. Adolphson, MD, Colby, 1996/2000-2003
Benjamin C. Wedro, MD, La Crosse, 1993/2000-2003
Staff support: Kendi Parvin/Terri Weaver

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email: bmc@brainerd.net
www.brainerdmedicalcenter.com

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218-828-7105

SMS Financial Report

Statement of Income and Expenses
Year ended December 31, 1999

Income	Unrestricted	Temporarily Restricted	Total
Membership dues	$ 3,699,349	$ -	$ 3,699,349
Sales and services	1,433,907	-	1,433,907
Investment income	131,373	-	131,373
Royalty income	327,607	-	327,607
Market value adjustments	89,246	-	89,246
Gain on investments sold	248,919	-	248,919
Rent	86,087	-	86,087
Grants	46,000	422,791	468,791
Membership fee replacement income	158,935	-	158,935
Other	-	36	36
Total income	$ 6,221,423	$ 422,827	$ 6,644,250
Expenses			
Payroll and employee benefits	$ 3,376,157	$ 337,055	$ 3,713,212
Non-employee commission	8,960	-	8,960
Travel and conference	622,376	18,589	640,965
General and administrative	1,236,347	(19,522)	1,216,795
Occupancy	336,553	-	336,553
Professional fees and outside services	558,578	84,902	643,480
Pension	284,772	-	284,772
Interest	37,687	-	37,687
Other	25	-	25
Total expenses	$ 6,461,455	$ 420,994	$ 6,882,449
Net increase (decrease) in equity	$ (240,032)	$ 1,833	$ (238,199)
Equity at January 1, 1999	$ 4,451,668	$ 20,623	$ 4,472,291
Equity in income of subsidiary	60,131	-	$ 60,131
Equity at December 31, 1999	$ 4,271,767	$ 22,456	$ 4,294,223

The above financial statements of the State Medical Society of Wisconsin are part of the Treasurer's report to the House of Delegates. The annual certified audit, prepared by Grant Thornton LLP, independent certified public accountants, is on file at Society headquarters. Members may review the audit by inquiry to the SMS Executive Vice President.

Balance Sheet
Year ended December 31, 1999

Assets

Current Assets	
Cash and cash equivalents	$ 1,864,481
Investments	2,302,181
Trade receivables (net)	348,630
Due from affiliates	70,375
Current portion of note receivable	509,542
Investment income receivable	31,579
Prepaid expenses	75,369
Total current assets	$ 5,202,157
Property & Equipment - at cost	
Buildings and improvements	$ 3,071,818
Furniture and equipment	2,179,662
Less accumulated depreciation	(2,953,527)
	2,297,953
Land	72,408
Total property and equipment	$ 2,370,361
Other assets	
Long-term investment	$ 249,000
Deferred compensation plan assets	1,315,058
Investment in subsidiary	298,721
Note receivable, less current portion	509,543
Note receivable from affiliate	100,000
Total other assets	$ 2,472,322
Total Assets	$ 10,044,840

Liabilities and Membership Equity

Current Liabilities	
Current maturities of long-term debt	$ 74,323
Trade accounts payable	217,306
Due to affiliates	165,658
Dues payable to other organizations	135,322
Deferred revenue	1,709,731
Accrued payroll and vacation pay	214,797
Accrued property, payroll & sales taxes	129,260
Accrued health plan costs	129,805
Other	25,463
Total current liabilities	$ 2,801,665
Long term debt, less current maturities	$ 454,777
Deferred compensation payable	$ 1,315,059
Accrued pension costs	$ 1,179,116
Membership equity	
Unrestricted	$ 4,271,767
Temporarily restricted	22,456
Total membership equity	$ 4,294,223
Total Liabilites & Membership Equity	$ 10,044,840

SMS departments serving members needs

Business Services & Support performs all necessary accounting tasks for the Society, the SMS Foundation, SMS Holdings Corporation and its subsidiaries; as well as financial and investment activities.

The Center (The Henry A. and Irene S. Anderson Center for Medical Practice Research and Education) is dedicated to the evaluation of all types of treatment modalities to determine best practices and to involve physicians directly in this inquiry. *(See related article on page 43.)*

The Division of Educational Programs & Services is responsible for practice management seminars and workshops, including in-house training and coding consultations for physician offices and assisting with coding and billing questions, chart review, corporate compliance program development, and consulting services. *(See related article on page 37.)* The department also coordinates all efforts surrounding the SMS CME accreditation program. *(See related article on page 35.)*

General Administration has overall responsibility for activities of the directors, officers, Wisconsin delegation to the AMA, the House of Delegates, councils and task forces.

Recruiting, rewarding and retaining a skilled staff for the SMS are the main focus of the **Human Resources Department.** Recent initiatives include the first employee survey, team-building training in several departments and a safety program including CPR/AED training. Other services provided to SMS staff include employee relations, performance coaching and benefits administration.

Marketing & Communications is responsible for media relations, public education and member communications. This department coordinates efforts to assure that communications to members, media and Wisconsin public are timely, accurate, consistent and effective. These efforts include an enhanced statewide media relations plan, with the objective of further educating the public government and health care industry regarding SMS positions on given public health issues. In addition, this group produces these official SMS communication vehicles: *WMJ*, the bi-monthly medical journal; *Medigram*, the monthly newsletter; the SMS annual report; On-Air Health Care, a weekly radio news feature and wismed.org, the SMS web site.

Meetings Management is responsible for planning, promoting and executing in excess of 700 meetings each year, including the Annual Meeting. Staff is also involved in the planning and development of other internal SMS programs and programs for Lakeside Association Services clients.

Membership & Professional Relations provides service to SMS members, directs feedback from physicians, physician groups, hospital and clinics to the appropriate bodies at SMS. Field Directors work with members based on interests, practice type and location. They attend county medical society meetings and hospital and clinic medical staff meetings, make hospital lounge visits and participate in small group and individual meetings to update physicians on legislative issues, public health issues and programs. The department is responsible for member recruitment efforts.

Office of General Counsel provides legal assistance to individual members, groups and representation for the organization as a whole. Among the review services offered are hospital medical staff bylaws, physician employment and managed care contracts and county medical society bylaw reviews.

Peer review services housed within the office include the Statewide Physician Health Program, the Medicaid Medical Audit Committee that advises the State Division of Health, the Council on Mediation and Peer Review, and liaison with MetaStar. *(See related articles on pages 32 and 34.)*

Professional Affairs is responsible for the combined activities of Federal Lobbying and Policy and Research. Policy & Research is primarily responsible for performing all background research on health care issues facing organized medicine and reporting its findings back to SMS working groups. Policy analysts also provide research on legislation, state and national regulation and other issues to individual physicians and their patients.

The Wisconsin Antibiotic Resistance Network (WARN) is a partnership between the SMS, the Marshfield Medical Research Foundation and the Wisconsin Division of Public Health. WARN is dedicated to reducing antibiotic overuse and reducing the spread of antibiotic-resistant bacteria that cause many upper respiratory illnesses. *(See related article on page 46.)*

Public Affairs is responsible for lobbying at the state level, WISPAC–the Society-sponsored political action committee, and Physicians for Better Government–the Society-sponsored conduit fund.

Public Affairs represents the SMS before the state government through lobbying efforts, political action, candidate support and political education activities. Staff reviews and analyzes proposed legislation and administrative rules, formulates legislation to carry out the Society's legislative initiatives and develops modifications to proposed legislation or regulations to achieve the Society's objectives or resolve concerns on specific issues. *(See related article on page 39.)*

Strategic Information Systems & Technology (SIST) provides technology support and solutions for Society and SMS Holdings staff. This department serves a vital role in providing the tools for efficient and effective information flow.

SMS Foundation is a non-profit corporation that fosters the knowledge and development of worthy educational, charitable, scientific research, and public health projects and assists deserving medical students through the student loan program and scholarship funds. *(See related article on page 40.)*

SMS Holdings

SMS Insurance Services, Inc. is the only Wisconsin-based, physician-owned insurance firm exclusively serving the medical community. Its sole mission is meeting the insurance needs of Wisconsin physicians, hospitals, clinics, related health care providers, their employees and families. *(See related article on page 38.)*

Lakeside Association Services, Inc. is an association management company providing a variety of essential services to non-profit organizations, including a number of medical societies in Wisconsin. Lakeside currently manages over 20 organizations, and specializes in providing service to organizations representing health care and public health professionals. Lakeside offers expertise and assistance in a wide variety of areas and provides non-profit organizations with quality, efficient, cost-effective services.

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920-919-0599

CARDIOLOGY – YEAR 2000
Greek Island and Turkey Yacht Cruise
September 21-29, 2000
Charles Stone, MD
Associate Professor of Medicine and Radiology
Director of Nuclear Cardiology
University of Wisconsin Medical School
12 hours AMA Category 1 Credit

UPDATE IN PAIN, PALLIATIVE CARE & INFECTION
Southern Caribbean Cruise
November 11-18, 2000
James F. Cleary, MD
Assistant Professor of Medicine, Director of Palliative Care
University of Wisconsin Medical School
Andrew Urban, MD
Chief, Infectious Disease
Wm S. Middleton VA Hospital
Clinical Assistant Professor of Medicine
Section of Infectious Disease, HIV Care Program
University of Wisconsin Medical School
14 hours AMA Category 1 credit

These programs are jointly sponsored by the University of Wisconsin Medical School and IPMC Travel

For further information, call **1-800-645-2222**

Statewide Physician Health Program

The Statewide Physician Health Program (SPHP) provides compassionate assistance to Wisconsin physicians suffering from any condition which has the potential to progress to impairment. These conditions include chemical dependency, psychiatric illness, stress, abusive-disruptive behavior, senility, compulsive gambling, behavioral disorders and physical impairment. The Statewide Program Managing Committee establishes policies and implements program activities. As a subcommittee of the Council on Mediation and Peer Review, the Managing Committee and its activities are protected by way of confidentiality and immunity under state and federal law.

SPHP offers education, identification, assessment and compassionate intervention. Physicians who are intervened are referred to acceptable facilities for evaluation or treatment and monitored for a minimum two-year follow-up after completion of initial therapy. The SPHP Medical Director provides continuous program leadership, conducts physician interventions and is available to Wisconsin physicians and hospitals to offer counsel regarding local problems.

Phase I: Education and prevention

Target individuals and groups are educated to learn symptoms of physician impairment, techniques of early identification and prevention, resources available for intervention, assessment and/or treatment and other problems associated with impairment. The SPHP Medical Director presents educational and prevention programs to the following target groups:

- **Physicians,** through meetings of hospital medical staffs, clinic groups, county medical societies, statewide continuing medical education, accredited seminars and presentations to faculty and students in Wisconsin's medical schools.
- **Hospital Personnel,** including hospital administrators and medical directors, chiefs of medical staffs and others. Consultation with medical staff officers on establishing effective physician health committees or programs in hospitals is available. "Guidelines for Physician Aid Committees of Hospital Medical Staffs" have been distributed to all Wisconsin general hospitals with encouragement to implement them in cooperation with medical staffs.
- **Pharmacists and nurses,** through lectures at meetings in combination with physician and hospital personnel.

Phase II: Intervention assessment and treatment

Successful programs include the availability of physician interveners to undertake compassionate contact with physicians identified as possibly impaired. The SPHP Medical Director or other trained physicians are available to meet with and urge impaired colleagues to enter suitable facilities for evaluation, treatment or both. Programs or facilities considered suitable are those which comply with Statewide Physician Health Program requirements.

The initial intervention is always a compassionate encounter. A punitive or coercive approach is never considered until all benevolent measures have been exhausted. An intervener's continuous concern is the professional and personal well-being of a colleague and the quality of health care for patients. Physicians suffering from chemical dependency achieve a more satisfactory recovery status when they receive intensive treatment in facilities which espouse the medical model of therapy, under which the physician is seen by the physician addiction specialist on a frequent, if not daily, basis. Within this model, SPHP maintains certain requirements for satisfactory primary treatment for chemical dependency.

Physicians suffering from emotional illness or senility, or from the sequela of stress when these are uncomplicated by chemical dependency, are encouraged to seek assessment, treatment or both through SPHP approved facilities or practitioners.

SPHP adheres to the policy that satisfactory recovery can only be realized through a monitored two-year recovery period. It considers the two years after initial treatment to be vital to assuring continued recovery.

Phase III: Benevolent assistance

In addition to the burden of impairment, some physicians are financially unable to pay the cost of the in-patient or out-patient care. By estimate, 10 percent of Wisconsin's impaired physicians have

either no or inadequate health insurance. The financial resources of some physicians essentially have been depleted. For 60 percent of chemically dependent physicians, residence in treatment and recovery homes (average of three months stay) is essential for completion of the two-year recovery program.

With SMS and SMS Foundation Board approvals, SPHP established a Physicians Benevolent Assistance Fund to provide low-interest loans to assist physicians to pay for in-patient and out-patient services. Loans are repayable after return to medical practice.

Phase IV: Protecting the public

SPHP maintains formal linkage with the Wisconsin Medical Examining Board (MEB) through the Coordinating Council on Physician Impairment. Consisting of three SMS members and three MEB members, the Council coordinates activities so that appropriate information is shared and the Council can take action in the event a physician fails to respond to treatment or refuses to enter rehabilitation. By majority vote, the Council may refer a physician to the MEB in the rare instance where the health of the public may be jeopardized. The Coordinating Council presents a desirable balance of concerns and interest between the voluntary assistance program of the State Medical Society and the Wisconsin statutory licensing and disciplinary body. Thus, the Council is an appropriate step in the reporting process if necessary during attempts at physician rehabilitation where difficulty may be encountered.

For further information contact Sonia Porter at the SMS, soniap@smswi.org.

SMS Physician Support Program

The SMS Commission on Medical Liability and Risk Management created the Physician Support Program in 1987 to help physicians and their families cope with the stress of being sued for malpractice. The program, which is now overseen by the Council on Health Care Access and Financing, provides emotional support, practical information and an opportunity for the physician and spouse to share their feelings with sympathetic listeners.

How the program works

Staff to the Council on Health Care Financing and Access receive a monthly listing of all physicians named in medical professional liability cases from the administrator of Wisconsin's Medical Mediation Panels. A letter is sent to these individuals. Upon request, the complete Physician Support Program packed is provided to SMS members for free and to non-members for a minimal cost. Packet materials include brochures and handbooks about liability and risk management and an explanation of the mediation process. The materials address both legal and emotional issues arising in the context of medical professional liability lawsuits. Also included is a list of Physician Support Program mentors and spouses who may be individually contacted to provide information and suppport.

The Physician Support Program mentors

The purpose of the mentors is to offer emotional support and practical advice for dealing with a medical malpractice suit. The emphasis is on personal contact and communication between the physician or spouse and the physician mentor. The setting of meetings is left entirely to the parties involved, and may be limited to telephone calls, if desired. Topics covered during meetings are expected to be wide ranging, (e.g. feelings of hostility, fear, loss of confidence, difficulty in making decisions, and withdrawal from the family), but discussions of the specific merits of the case are avoided. The emphasis is on individual interaction and open and frank discussions. There are no group sessions. Confidentiality is assured in all cases.

Any practicing physician who has been a respondent in a malpractice action and feels he or she can offer emotional support to a colleague in a similar situation is encouraged to volunteer as a support group member. Spouses who can provide support for their counterparts are also invited to participate. Each mentor receives basic information about the program and advice on how to be an effective participant.

Physicians interested in receiving a copy of the Physician Support Program materials or in being a mentor should contact Erin Warner at the SMS, erinw@smswi.org.

Resolving complaints about medical care

Medical care is a very personal matter between patient and physician, but medicine is not an exact science. Each patient is different from all others and treatment approaches may vary greatly from patient to patient.

Doctors and patients sometimes do not agree on how proper care is defined. At times misunderstandings arise about what the physician hopes to accomplish and what the patient expects. When this occurs, it is important that the patient first discuss any questions and concerns regarding medical treatment with his or her physician. In the event that such differences are not resolved at the doctor/patient level, the State Medical Society offers a means for resolving these differences.

Council on Mediation and Peer Review

The Council on Mediation and Peer Review is able to assist patients in resolving complaints about medical care. Council members represent many different specialties. Any person may telephone or write the SMS to file a complaint. A staff person will assess the problem, try to resolve it informally and, if necessary, submit the problem to the council as a formal complaint.

How to file a complaint

Only written complaints against physicians are considered by the council. The complainant should include the name and address of the physician against whom the complaint is being made, along with details of the situation prompting the complaint, as well as his/her own address and telephone number. If necessary, the SMS will request written authorization for copies of medical records relating to the complaint. All information received regarding a complaint remains confidential.

The council process

When the council determines it may assist the complainant, it must be decided at what level the complaint will be handled. The Council on Mediation and Peer Review handles the complaint if the physician and patient reside in separate counties. If both parties reside within the boundaries of a single county medical society, the complaint will be forwarded to that county society if the county has a process in place to resolve complaints. If the county will not or cannot handle the complaint, the council retains jurisdiction over the complaint.

Next, a copy of the complaint is mailed to the physician for his/her response. Once a response is received, both sides of the situation are referred to a member of the council in the same specialty as the physician about whom the complaint is lodged. Once the review is completed, a reply is sent to the physician and one to the patient indicating the results of the review. The council may take a number of actions, including finding simple miscommunications, or directing the physician's attention to possibly inappropriate conduct or service, or referring the complaint to the SMS Board of Directors, who then may refer it to the Wisconsin Medical Examining Board (MEB). The MEB is the official state agency having authority to suspend or terminate licensure. An appeals process is in place for both the complainant and the physician if needed.

Types of complaints handled by the council

The Council process is intended to be an informal remedy for patient grievances. The council handles physician complaints relating to quality of care issues. The council does not review complaints regarding fees and billing.

A more formal mechanism is available through the Wisconsin MEB staff may initially refer the complainant to the MEB depending on the seriousness or nature of the complaint. The council will not review a complaint that is simultaneously being reviewed by the MEB or if legal action has been initiated.

Contact the SMS for more information regarding the Mediation and Peer Review process, 608.257.6781, or toll free 1.800.362.9080.

Accreditation Program for Continuing Medical Education

The SMS's accreditation program functions under the authority of the Accreditation Council for Continuing Medical Education (ACCME). Representatives from the American Board of Medical Specialties, American Medical Association, Association for Hospital Medical Education, Association of American Medical Colleges, American Hospital Association, Federation of State Medical Boards, and the Council of Medical Specialty Societies comprise the ACCME.

The SMS Council on Continuing Medical Education currently reviews and accredits 52 hospitals, nine specialty societies, three professional organizations, and two county medical societies in Wisconsin. *Information is available from the SMS Division of Educational Programs and Services, 800.362.9080. Contact Karen Carney, karenc@smswi.org, or Elaine Stern, elaines@smswi.org.*

Category 1

Category 1 CME designated by an accredited sponsor must meet the following requirements:

- be sponsored by an organization accredited for continuing medical education by the Accreditation Council for Continuing Medical Education (ACCME), and
- be designated as AMA PRA Category 1 education by that organization.

Category 1 activities can take the form of lectures, seminars, self-assessment programs, mini-residencies and use of audio-visual or computer-based materials, so long as they are designated as AMA PRA Category 1.

Category 2

All Other CME Activities

In December 1995, Category 2 was defined as all educational activities not designated Category 1, that 1) comply with the AMA definition of CME, 2) comply with AMA ethical opinions on Gifts to Physicians from Industry and on Ethical Issues in CME, and 3) a physician finds to be a worthwhile learning experience related to his/her practice.

Sponsor-Designated AMA PRA Category 2

Accredited sponsors may designate conferences and workshops as AMA PRA Category 2, in accordance with the requirements in Part II. Sponsors are not required to record and maintain attendance information.

Physician-Designated AMA PRA Category 2

Learning experiences that are not designated Category 1 and are not included in the reading requirement can be claimed for Category 2, including:

- consultation with peers and medical experts,
- developing and reviewing quality assessment data,
- use of electronic databases in patient care,
- use of enduring materials,
- small group discussions,
- self-assessment activities,
- journal club activities not designated AMA PRA Category 1,
- teaching health professionals,
- medical writing,
- teleconferences,
- preceptorships, and
- lectures, seminars and workshops not designated for credit.

The following Wisconsin organizations were accredited by SMS and ACCME for continuing medical education programming as of June 1, 2000.

Accredited Hospitals

All Saints Healthcare, Inc., Racine
Bellin Memorial Hospital, Green Bay
Beloit Memorial Hospital, Beloit
Berlin Memorial Hospital, Berlin
Children's Hospital of Wisconsin, Milwaukee
Columbia Hospital, Milwaukee
Community Memorial Hospital, Menomonee Falls
Fort Atkinson Memorial Hospital, Fort Atkinson
Franciscan Skemp Healthcare, La Crosse

Gundersen Medical Foundation, Ltd and
La Crosse Lutheran Hospital, La Crosse
Hartford Memorial Hospital, Hartford
Howard Young Medical Center, Woodruff
Kenosha Hospital and Medical Center, Kenosha
Langlade Memorial Hospital, Antigo
Luther Hospital, Eau Claire
Marshfield Clinic/St Joseph's Hospital, Marshfield
Memorial Hospital of Iowa County, Dodgeville
Mendota Mental Health Institute, Madison
Mercy Health System, Janesville
Mercy Medical Center, Oshkosh
Meriter Hospital, Madison
Reedsburg Memorial Hospital, Reedsburg
Ripon Memorial Hospital, Ripon
Riverside Medical Center, Waupaca
Sacred Heart Hospital, Eau Claire
Sacred Heart-St Mary's Hospital, Inc, Rhinelander
St Agnes Hospital, Fond du Lac
St Clare Hospital, Baraboo
St Elizabeth Hospital, Appleton
St Francis Hospital, Milwaukee
St Francis Medical Center, La Crosse
St Joseph's Community Hospital, West Bend
St Joseph's Hospital, Chippewa Falls
St Joseph's Hospital, Milwaukee
St Luke's Hospital, Milwaukee
St Mary's Hospital, Green Bay
St Mary's Hospital, Milwaukee
St Mary's Hospital Medical Center, Madison
St Mary's Hospital-Ozaukee, Mequon
St Michael Hospital, Milwaukee
St Michael's Hospital, Stevens Point
St Vincent Hospital, Green Bay
Sauk Prairie Memorial Hospital, Prairie du Sac
Shawano Medical Center, Shawano
Sinai Samaritan Medical Center, Milwaukee
Stoughton Hospital Association, Stoughton
The Monroe Clinic, Monroe
United Health Hospitals, Neenah
Veterans Administration Medical Center, Tomah
Watertown Memorial Hospital, Watertown
Waukesha Memorial Hospital, Waukesha
Wausau Hospital Center, Wausau
Winnebago Mental Health Institute, Winnebago

Accredited Specialties

Milwaukee Gynecological Society
Milwaukee Ophthalmological Society
Wisconsin Academy of Family Physicians
Wisconsin Association for Perinatal Care
Wisconsin Neurological Society
Wisconsin Psychiatric Association
Wisconsin Society of Anesthesiologists
Wisconsin Society of Otolaryngology-Head and Neck Surgery
Wisconsin Society of Pathologists

Accredited County Medical Societies

Dodge County Medical Society
Rock County Medical Society

Other Accredited Organziations

MetaStar
PIC Wisconsin
Wisconsin Association of Medical Directors

ACCME Accredited

Medical College of Wisconsin
UW Center for Health Sciences
Interstate Postgraduate Medical Association
State Medical Society of Wisconsin

PRIMARY CARE UPDATE
October 23–26, 2000
Hyatt-Embarcadero Center, San Francisco, CA

Practical aspects of office and hospital management will be emphasized. Designed not for profit but for excellence in continuing medical education. Interstate Postgraduate Medical Association (IPMA) offers the finest program and speakers at a cost that is among the lowest available. Physicians: $350 before 9/29, $375 9/29 through 10/13, $400 thereafter. Residents: $75. Allied Health Personnel: $150. US funds only. Approved for 27 hours by AMA-PRA and AAFP.

IPMA is among the oldest continuous medical teaching assemblies in North America, founded in 1916 by physicians from Wisconsin, Illinois, and Iowa. Physicians from these three states make up its board of directors. This year's Wisconsin trustees are: Drs. John Beasley and Richard Shropshire, Madison, and Cheri Olson, La Crosse. The list of past presidents reads like a who's who of medicine, including such luminaries as William J. Mayo, Charles W. Mayo, George W. Crile, Frank H. Lahey, and Alton Ochsner.

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See brochure on the Web: www.postgradmed.com.

Division of Educational Programs and Services

The State Medical Society of Wisconsin Division of Educational Programs and Services offers opportunities that will help maximize physicians' most valuable resources: time, money and knowledge.

Professional Development Programs

Over 6,000 physicians, medical group managers and coding and billing staff attend SMS educational programs throughout the state each year. Covering topics ranging from Medicare and Medicaid to CPT and ICD-9-CM coding, documentation and compliance, SMS professional programs are considered "the source" for practice management education. A course listing can be found in the Professional Development Programs calendar or on the SMS web site at www.wismed.org under Education.

SMS Practice Management Consulting Services

In addition to the professional development programs, SMS offers customized on-site education programs. SMS consultants work side-by-side with office personnel to help ensure the most cost- and time-effective operations possible. These programs include medical chart review for coding and documentation compliance and assistance with compliance program development.

Medical Chart Review

SMS consultants will identify overcoding, undercoding, unbundling of services, inappropriate and missed coding opportunities. Identification and correction of these problem areas will result in more revenues, minimize future audit and liability risks, allow for better allocation of health care resources, and establish complete and accurate billing and reimbursement records.

Corporate Compliance Program

An SMS consultant works in the physician's office, helping develop a corporate compliance program to prevent and detect non-compliance with Medicare and other billing requirements. SMS consultants educate designated staff on the important components of a compliance program and help develop policies and procedures for coding and billing processes. In addition, SMS consultants create a system to monitor coding accuracy, review billing procedures and provide on-going coding education and resources.

On-site Education

Any program found in the Professional Development Programs calendar can be customized for a physician's office and delivered directly to office staff.

SMS experts on legal, governmental, insurance and practice management issues address specific topics related to Wisconsin health care professionals. Each consultant is a Certified Professional Coder (CPC) through the American Academy of Professional Coders (AAPC), and/or a Registered Health Information Technician or Registered Health Information Administrator through the American Health Information Management Association (AHIMA), and/or a registered nurse. SMS professional staff offers proven experience physicians can trust.

Physican Coding Profiling

Physician coding profiling provides information relating to a physician's potential audit risk and/or potential for loss of revenue. From this data, payor comparisons to Medicare's national specialty data and assumptions are made about the physician's practice based on a utilization profile. Medicare's national specialty data is considered the benchmark for code utilization and is typically used for identification for Medicare audit activities.

An SMS consultation includes the creation of a profile using the physician's CPT code utilization frequencies. This profile will compare a physician's data to Medicare's national data and local Wisconsin data for the appropriate physician specialty. SMS consultants also provide physicians with an analysis relating to coding patterns and insights as to what Medicare and other payers already know about his or her practice.

Physicians benefit by validating that their profiles accurately represent their individual practice. If differences exist between the services they provide and their code utilization patterns, they will benefit from further review of their coding and billing processes.

Serving the insurance needs of Wisconsin's medical community

SMS INSURANCE SERVICES INCORPORATED

Every year physicians are solicited by dozens of insurance and investment companies. While most of these firms are knowledgeable and professional, only one exclusively serves Wisconsin's medical community – SMS Insurance Services, Inc. (SMSISI).

A subsidiary of SMS Holdings Corporation, SMSISI offers an array of products and services to match the needs of physicians, clinics and hospitals:

Professional Liability
- Claims-Made and Occurrence Policies (Special SMS member benefit programs available)
- Entity Professional Liability
- Hospital Professional Liability

Personal Insurance
- Home/Auto
- Long- and Short-term Disability
- Long-term Care
- Estate/Retirement Planning
- Personal Umbrella

Business Insurance
- General Liability
- Directors and Officers
- Workers' Compensation
- Building and Contents
- Specialty Products

Employee Benefits
- Group Life, Medical and Dental Coverage
- Long- and Short-term Disability
- Long-term Care
- Flexible Spending Accounts

Focusing our resources enables us to do a better job for Wisconsin's medical community. From professional liability coverage to protection of personal property, our experts are dedicated to serving SMS members.

For insurance products and consulting please contact one of the following:

In Madison: Mary Beth Davis or John Dremsa, 800.545.0631.

In Milwaukee: Kathy Mueller or Dave Serena, 800.474.7500.

In Brookfield: Russ Heil or Andy LaVoi, 262.785.4345.

One of the greatest benefits of doing business with a physician-owned insurance company is that the profits help SMS do more for members.

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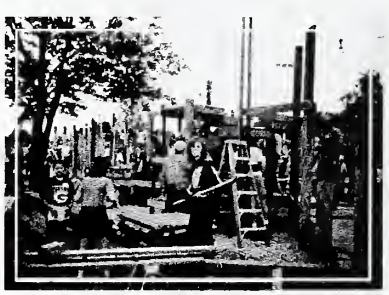
For more information call 800.545.0631 or visit www.smsinsurance.com.



AT THE MONROE CLINIC, WE'RE BUILDING

HEALTHIER COMMUNITIES!

At The Monroe Clinic, we serve all persons without any form of discrimination, especially those who are economically disadvantaged, and we remain committed to treating all people as we would wish to be treated ourselves. Our 70+ employed physicians provide care to over 1,000 patients daily at our main clinic and hospital in Monroe, Wisconsin, and eight branch clinics in southern Wisconsin and northern Illinois.

Currently, we're seeking **BC/BE Physicians** who share our commitment to quality care, compassion and dignity:

- **Internal Medicine**
- **Family Practice**
- **Med/Peds**
- **Dermatology**
- **Psychiatry**
- **Cardiology**
- **OB/GYN**
- **Radiology**

Competitive salary and full benefit package. Rated #13 in Compton's 100 Best Small Towns, Monroe is known for family values, friendliness, reasonable cost of living, and excellent schools. Please respond with CV or contact: Denise Siemers, Physician Staffing Specialist, The Monroe Clinic, 515 22nd Avenue, Monroe, WI 53566. Phone: 1-800-373-2564. Fax: 1-608-324-2469. E-mail: dsiemers@themonroeclinic.org Website: www.themonroeclinic.org

The Monroe Clinic
A proud caring tradition

A Catholic sponsored institution with a proud and caring tradition.
EOE. Not eligible for J-1 visa employment

The Monroe Clinic. We Serve. We Respect. We Value.

WISPAC, PFBG offer opportunities to be heard at the Capitol

Increased political activism is essential for ensuring that physicians' voices are heard in the legislature on issues such as health care reform and patient rights. The Wisconsin Physicians Political Action Committee (WISPAC) and Physicians for Better Government (PFBG) help steer the future of Wisconsin medicine in the right direction.

WISPAC was created as the State Medical Society's bipartisan political action committee to meet the demands of physicians concerned with the future of health care in Wisconsin. Its members understand that becoming a part of the political process sends a strong message to the legislature – a message that physicians are informed and support candidates who support quality health care.

Looking at the most recent legislative session, it is evident that WISPAC and PFBG are essential to quality public health policy in Wisconsin. This year, SMS lobbyists have been highly successful on such issues as patient consent, securing tobacco money for tobacco prevention and tort reform. Much of this success can be attributed to the fact that WISPAC supports and elects pro-medicine candidates. Without continued physician involvement, these recent successes could become distant memories.

Therefore, it is imperative for past WISPAC members to renew their memberships and for every prospective member to join. The ability to assist candidates who support medicine is severely limited by political apathy.

WISPAC is affiliated with the American Medical Political Action Committee (AMPAC), the American Medical Association's political action committee. AMPAC has members nationwide who support US Congress candidates. WISPAC has an extremely good record for getting AMPAC funds back to House and Senate candidates in Wisconsin.

PFBG is a direct-givers program, a political conduit. It allows each member to put money into an individual "political savings" account. Through PFBG, members give money in their name to candidates they support. Every member receives personal recognition in addition to sending a unified message to our elected officials that physicians are politically active and aware.

No other health care organization can offer more information about current elected officials and political candidates than WISPAC and PFBG. WISPAC and PFBG keep members informed about legislation and candidates that will affect medical practices and patients' rights.

WISPAC provides several suggested contribution levels: $500 for Chairman's Club *($350 for PFBG, $100 WISPAC, $50 AMPAC)*; $200 for Sustaining Membership *($100 PFBG, $50 WISPAC, $50 AMPAC)*; and $150 for Sponsoring Membership *($50 PFBG, $50 WISPAC, $50 AMPAC)*. Members may request that contributions be allocated according to their own specifications among the three accounts. Donations to WISPAC, PFBG and AMPAC are not deductible as charitable contributions for federal income tax purposes.

WISPAC Officers

Chairman: Kenneth Viste, Jr., MD
Vice Chairman: Sridhar Vasudevan, MD
Secretary-Treasurer: Sandra Osborn, MD
Assistant Secretary-Treasurer: Robert McDonald, MD
Executive Director: Alice O'Connor

Congressional District #1
J. Christopher Noonan, MD; Steven Azuma, MD

Congressional District #2
Robert McDonald, MD; Sandra Osborn, MD

Congressional District #3
Mark Andrew, MD

Congressional District #4
Randi Hart, MD; Thomas Slota, MD

Congressional District #5
Gregory Gnadt, MD; Charles Rainey, MD

Congressional District #6
Timothy Flaherty, MD; Kenneth Viste, Jr., MD

Congressional District #7
Richard Ulmer, MD; Robert Phillips, MD

Congressional District #8
Robert McQueeney, MD

Congressional District #9
Sridhar Vasudevan, MD; Michael Reineck, MD

Members-at-Large
Steven Bergin, MD; Carl Eisenberg, MD; Bruce Jacobson, MD; Linda Minnihan, Alliance member; John Riesch, MD; Evan Saunders, MD; Daniel Sherry, MD; Jonathan Thomas, MD; Mary Weber, Alliance member; Paul Wertsch, MD

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For more information contact Sara Finger, Political Membership Coordinator, saraf@smswi.org.

SMS Foundation

The SMS Foundation was chartered by SMS in 1955 as a nonprofit, nonstock corporation to enable physicians and other friends of the profession to support, through gifts and grants, projects vitally affecting scientific medicine and public health. The Foundation's scope of interest has grown because of estate gifts received; therefore, a number of worthy programs affecting medical education and health care needs in Wisconsin can be accomplished. Foundation assets are at the $8 million mark.

Achievements

Research, Scientific and Public Health. Over the years, several research and scientific funds have been created from memorial contributions. The funds' income provides grants each year for psychiatry, surgery, family practice, pathology and biomedical research.

Public Health Care Issues. A number of grants are allocated each year for public health care initiatives. Tobacco, domestic abuse, child safety and mental health have been some of the primary focuses in recent years.

During the SMS Annual Meeting, Kenneth M. Viste, Jr., MD, honors the 2000 Houghton Award Recipients: Joshua Kavin Modder, outstanding senior of the UW Medical School, and James K. Robinson, III, outstanding senior from the Medical College of Wisconsin. Doctor Viste is president of the SMS Foundation.

Center for Medical Practice Research and Education. The SMS Foundation, Inc. had its second year of fund-raising for the newly formed Henry A. and Irene S. Anderson Center for Medical Practice Research and Education. Spearheaded by Sandra Osborn, MD, and John Petersen, MD, over $103,000 has been raised from 138 donors in addition to the leadership gift of $250,000 from the Anderson family in 1998.

Medical Outcomes Research Project. Another primary focus for 1999 was meeting with corporations, county medical societies, and individuals to encourage their support of the Medical Outcomes Research Project for the current condition studies in asthma and acute low back pain. In total, over $195,000 was raised in support of the Outcomes Studies in 1999.

Over 50 physicians and individuals made combined contributions of $31,000, and 12 county medical societies gave gifts totalling over $7,700: Dane, Dodge, Fond du Lac, Jefferson, Juneau, La Crosse, Pierce/St. Croix, Racine, Vernon, Walworth and Wood counties.

These gifts led to reaching the $25,000 matching goal of the Physicians Insurance Company challenge grant in 1999. In addition, another $25,000 was given to the endowment fund, for a total of $300,000 given to the project to date.

Corporations and pharmaceutical companies also played a major fund-raising role by contributing over $89,000. The leadership gifts of $22,000 from Pfizer, Inc. in support of the low back pain study and $27,000 from Glaxo Wellcome, Inc. in support of the asthma study were greatly appreciated. Roche continues to provide education support for the Medical Outcomes Symposium at the $10,000 level, as well as $5,000 in unrestricted support.

United Wisconsin Services Foundation has made a two-year pledge of $25,000. In addition, Wisconsin Physicians Service Insurance Company is providing in-kind printing services totaling over $18,000. Lastly, a grant of $12,500 was received from the American Lung Association in support of the adult asthma study.

SMSF Charity Golf Classic. The 10th annual charity golf classic was held at Bishops Bay Country Club in Madison with guest host pro golfer

Andy North. Over $56,000 was raised from corporations, clinics and individuals.

Landis Lecture. Mary Landis, widow of Charles Landis, MD, from Elm Grove, Wisconsin, established a memorial lecture fund with a leadership contribution of $200,000. The lecture will serve as a lasting tribute to her husband, who dedicated his life to professional and public education programs relating to psychiatry and mental health. The second lecture was held on November 12, 1999 in conjunction with the Wisconsin Psychiatric Association in Milwaukee.

Student loans, grants and scholarships. One of the Foundation's most important activities is the student loan program. Established in 1955, the Foundation's general student loan fund is designed to assist needy, deserving students preparing for careers in medicine. The long-term, low-interest loans are interest-free until after the student graduates. Medical students must be attending the UW Medical School or the Medical College of Wisconsin.

Through the fiscal year ending June 1999, the Foundation granted 102 loans to medical and allied health students for a total of $570,000. More than $3,325,000 has been allocated since the program's inception in the late 1950s.

Although the Foundation's primary emphasis is in loans, some scholarships and grants are provided to fulfill the wishes of donors and the needs of certain potential recipients. These loan and scholarship funds are administered by the Foundation according to the wishes of the individual or organization establishing and supporting the fund.

Applications may be procured from the SMS Foundation, 330 E Lakeside St, Madison, WI, 53715 or the medical colleges' financial aids offices. Loans provide $5,000 to sophomores, juniors and seniors.

Wisconsin Senior Physicians. The Foundation coordinates an annual meeting for this group, which was formed in the fall of 1980 to plan and implement ways for retired physicians to continue to be part of medical advances. All physicians age 60 and over are invited to join the group. A $35 membership fee is requested.

Foundation Grant Allocation. During 1999, the Foundation contributed to a number of worthy projects through unrestricted and restricted contributions:

- Beaumont Lecture of the Wisconsin Surgical Society
- Doctors Ought to Care
- Medical Students Volunteer Corps
- State Medical Society of WI Alliance for the Workshop on Health
- Tobacco-Free Wisconsin Coalition
- Volunteer Braillists & Tapists, Inc.
- Wisconsin Rural Partners Health Task Force
- Wisconsin Research Network
- Wisconsin Safety Patrols, Inc.

Foundation Facts

Management. The Foundation's governing power is vested in a board of trustees composed of SMS directors and officers, other medical and nonmedical members elected by the board of directors, and one representative elected by each component medical society. The board of directors of the corporate trustees consists of 18 members including the president, vice president, secretary and treasurer of SMSF. Seven members may be nonmedical trustees. Members are selected for staggered three-year terms.

The Foundation is registered with the Secretary of State as a charitable organization for purposes of contributions and fund-raising under [***]440.41(2) of the Wisconsin Statutes.

The SMS Foundation is a 501(c)(3) nonprofit corporation, and contributions are tax deductible under both state and federal tax laws.

SMS Foundation Officers

President: Kenneth M. Viste Jr., MD, Oshkosh
Vice President: Sandra L. Osborn, MD, Verona
Treasurer: Rockne G. Flowers, Stoughton
Secretary: John E. Patchett, JD, Madison

Directors

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John Petersen, MD
John Riesch, MD
Stephen B. Webster, MD, La Crosse
**ex-officio*

Executive Director

Julie A. Hein, CFRE, Madison

SMS Foundation guide to gifts

Gifts to the Foundation may take a number of forms: cash, bequests, trusts, life insurance, real estate, stock or other securities. Some physicians

make the Foundation a beneficiary of their wills. Such gifts may be designated as unrestricted or for specific immediate use at the discretion of the foundation trustees. They may also be restricted or earmarked for specific purposes of interest to the donor.

Cash gifts. Most contributions received by the Foundation are cash gifts. The Foundation currently asks for a voluntary contribution of $100 from SMS members through the dues statement and other direct mail solicitations. In 1999, $23,000 was raised through 238 such contributions.

Planned gifts. The simplest planned gift is through a bequest. Ideally, the donor notifies the beneficiary or charitable organization of their intentions so the organization can plan accordingly for future programs. The donor may use simple wording to benefit the SMS Foundation, for example: "I give (describe dollar amount, property to be given, or portion of residuary estate) to the SMS Foundation, Inc., a Madison, Wisconsin, qualified charity under IRC § 501(c)(3) to be used in such manner as the Foundation determines."

Darold A. Treffert, MD, Fond du Lac, and Kenneth M. Viste, Jr., MD, Oshkosh, pay a special tribute to Mary Landis at the Annual Meeting. Mrs. Landis gave a major endowment gift to the Foundation for the Charles W. Landis MD Memorial Lecture Fund in memory of her husband, a respected psychiatrist from Milwaukee.

Stock or other securities. Current gifts may take the form of stock or other securities that have appreciated in value. Such gifts permit the donor to realize substantial tax advantages.

Physicians Insurance Company (PIC) of Wisconsin stock contribution program. Physicians and clinics that chose not to tender their shares of PIC Wisconsin stock during the company's Dutch auction were invited to contribute shares to the Foundation. Seventy-two shares were contributed in 1999 for a total of 155 shares received. The SMS Foundation Board of Directors has deemed these shares as future holdings for the Foundation's General Endowment Fund.

Pooled life income fund. Life income gifts are gifts from which the donor and a designated beneficiary receive lifetime income. After the lifetimes of the "income beneficiaries," the SMS Foundation will receive the principal to reinvest or use for whatever purposes deemed appropriate by the Board of Directors.

Pooled Life Income Funds are ideal for highly appreciated stock contributions. They provide immediate savings through an income tax deduction in the year of the gift. They could mean an increase in current income, and they eliminate a capital gains tax.

Endowment Plus. For annual gifts as low as $200, life insurance offers an easy means to make a substantial gift and provide tax advantages. Endowment Plus is a fully tax deductible, irrevocable insurance program underwritten by Transamerica Assurance Company. There are no personal or medical questions to answer and no physical exam is required.

Real estate. Any standard form of warranty deed or acceptable quick claim deed may be used to deliver real estate to the Foundation.

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For further information regarding the SMS Foundation, please contact Julie A. Hein, SMS Foundation, PO Box 1109, Madison, WI 53701; 608.257.6781 or 1.800.362.9080, or e-mail julieh@smswi.org.

The Center

The Henry A. and Irene S. Anderson Center for Medical Practice Research and Education offers a noncompetitive, secure home for medical practice improvement research and discourse on best practices without regard to health system affiliation.

Vision

The vision of the Henry A. and Irene S. Anderson Center for Medical Practice Research and Education (the Center) is to be the primary source for research on medical quality and benchmarking information in Wisconsin. This will be accomplished largely through the Medical Outcomes Research Project (MORP). In addition, the Center will be a leader in offering continuing medical education to promote evidence-based physician practice. The Center's goals for conducting medical practice research and offering physician education will further enhance the profession of medicine and help physicians determine its path.

The Center is uniquely positioned to:

- provide a neutral forum for data collection, analysis and dissemination
- provide comparative data at the physician, clinic or health plan level
- capitalize on physicians' competitive nature to help reduce practice variation not linked to meaningful differences in patient outcomes
- provide physicians with the information they need to understand the quality side of health care value
- be the central data repository for benchmarking information from Wisconsin patients
- obtain economies of scale through standardizing data collection and centralizing data analysis

For more information, contact Cindy Helstad, PhD, RN, at 608.257.6781, or e-mail cindyh@smswi.org.

Medical Outcomes Research Project (MORP)

The Center is the institutional home of the Medical Outcomes Research Project (MORP). Started in 1995, the MORP helps physicians answer the demand for accountability from health care systems, patients, payers, purchasers and society. The MORP responds to this demand by assessing health outcomes in a standardized way using validated survey questions and survey research methodology. The aim of the MORP is to transform data into comparable information about medical care and patient-reported health outcomes. In this way, physicians are able to use the reports for peer review activities and benchmark how their patients respond compared to other physicians' patients. Information learned from the MORP studies has also been used to stimulate local Continuous Quality Improvement (CQI) initiatives.

The Natural History of a MORP Study

The starting point for all of the studies is choosing a health condition with significant morbidity, high frequency and high cost in the general population. An additional requirement is that treatment guidelines must already be developed for the care of patients with the health condition.

Physicians interested in outcomes research about a specific health condition volunteer as study group members. Center staff is assigned to work with the study group to design and implement the study. Study groups meet every four to six weeks in person or via teleconference. During these meetings, the study group selects research questions, chooses appropriate surveys for answering those questions, determines patient eligibility criteria, decides how patients will be recruited and chooses standard reports for displaying the collected data.

Eligible patients are identified from administrative data. Those patients receive a letter inviting them to participate in the study and answer a mailed paper and pencil survey. Completed patient surveys are transferred from the patient's clinic to the Center without personal identifying information. The Center staff follows strict policies about data confidentiality and security related to data transfer procedures. Once the surveys are transferred to the Center, the data are scanned into a database and error checks are performed. Data analysis follows leading to clinic-level and physician-level reports. When all of the data have been received by the Center, aggregate results are published.

All study data that are collected and transferred to the State Medical Society are confidential. Patient confidentiality is a crucial element of the outcomes studies.

2000 MORP Studies: Adult Asthma

Asthma is a chronic inflammatory disease of the airways affecting nearly 6 percent of the Wiscon-

sin population. Asthma has moved to the forefront of the public's attention with reports of sudden deaths from asthma attacks, an increased incidence of children with asthma and the disabling effects of asthma on people's quality of life.

In 1999, the Adult Asthma Study Group became the first MORP study group to successfully collect, analyze and publish patient-reported outcomes data. This milestone is being followed by the development of the Asthma Toolkit®. Study group members have pooled their best asthma care resources into a toolkit aimed at primary-care providers who treat adult patients with asthma. A draft Asthma Toolkit® was sent out for peer review in May. Distribution of the toolkit will begin in September 2000.

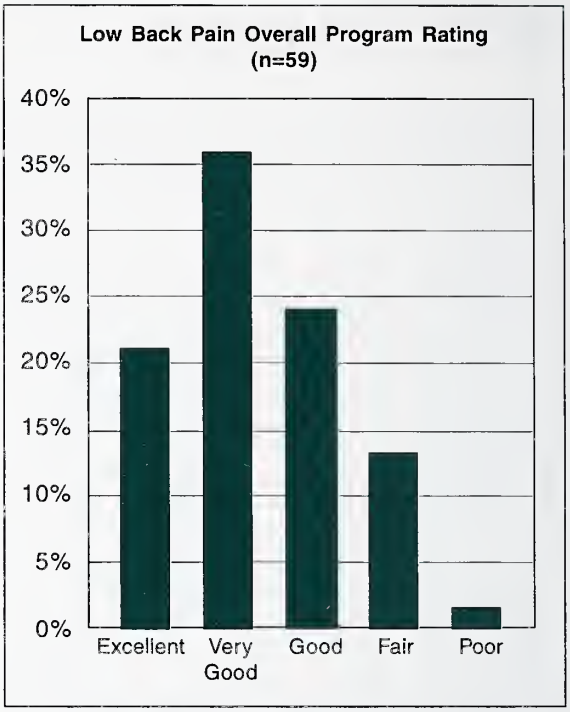
The Asthma Toolkit® is organized by the same key indicators of asthma care that were measured in the Adult Asthma Pilot Study. The pilot study revealed that all of the surveyed patients received care consistent with national practice guidelines on at least one indicator. However, the results also revealed opportunities for improvement in patient care. The Asthma Toolkit® provides resources that primary care physicians can use to improve patient-reported indicators. Fact sheets are grouped under the following categories:

- Medications for control
- Peak flow use
- Asthma trigger knowledge
- Written care plan
- ER visit in the last six months
- Nocturnal attacks
- Information to manage severe flare-ups
- Tools for measuring process and outcome indicators
- A directory of asthma resources

Bruce Berry, MD, Milwaukee, chairs the study group. *For more information, please contact Mary Bowers at 608.257.6781, or e-mail maryb@smswi.org.*

2000 MORP Studies: Acute Low Back Pain

Reaching a second milestone for the MORP, the Low Back Pain (LBP) Study Group presented the preliminary results of its pilot study on April 1, 2000, at the SMS Annual Meeting in Milwaukee. Twelve-month follow-up data collection and analysis will be completed by December 2000. During this phase, the study seeks to determine if patients with acute low back pain return to US norms on physical function measures. Results of the pilot study suggest that patients are not returning to normal physical functioning at three months. This finding sharply contrasts with



national treatment guidelines suggesting that most patients 'recover' from acute low back pain in six weeks with conservative treatment.

Physicians attending the Low Back Pain Symposium received one credit hour in Category 1 of the Physician's Recognition Award of the American Medical Association. Sixty-six physicians registered for CME and 82 percent of respondents believed the program met the listed objectives. The graph above displays the physicians' answers to the question, "Please rate the program overall."

Current efforts are aimed at collecting 12 month follow-up data on the 338 patients who started the study. The patients are from 15 clinics around Wisconsin.

James Stoll, MD, Milwaukee, chairs the study group. *For more information, please contact Mary Bowers at 608.257.6781, or e-mail maryb@smswi.org.*

2000 MORP Studies: Pediatric Asthma

Asthma is the most common chronic childhood disease. It affects 4.8 million children in the United States who are estimated to miss more than 10 million school days per year due to asthma. The costs of lost work time by parents caring for children who miss school are estimated between $900 -$1 billion a year. Among children under age 5, there has been a 160 percent increase in the prevalence of asthma since 1980.

The Pediatric Asthma Study Group is conducting a pilot study to assess the medical outcomes of children with asthma and to determine whether children are receiving care that is consistent with

national guidelines. This information is obtained from parents who complete a mailed paper and pencil survey. Parental information is combined for each study site to produce reports on patient health status, care satisfaction and key indicators of asthma care. These benchmarking reports can be used for peer review to highlight areas of excellence and opportunities for improvement.

John Meurer, MD, Milwaukee, chairs the study group. *For more information, please contact Mary Bowers at 608.257.6781, or e-mail maryb@smswi.org.*

2000 MORP Studies: Diabetes

Diabetes is a chronic and costly disease affecting over 300,000 people in Wisconsin. In order to prevent or delay its numerous medical complications, the Centers for Disease Control and Prevention provided funding to the Wisconsin Department of Health and Family Services, Diabetes Control Program to develop local practice guidelines aimed at improving the care of people with diabetes. The Diabetes Advisory Group, a committee of over 40 key stakeholders in diabetes care, developed the Essential Diabetes Mellitus Guidelines (EDMG). The guidelines serve as a tool to support and influence medical decisions and to encourage physicians to provide consistent and comprehensive preventive diabetes care. They address key measures and procedures that have the greatest potential to improve diabetes care such as: hemoglobin A1c monitoring, eye exams, foot exams, and microalbuminuria levels.

Distribution of the EDMG began in 1998. In addition to publicizing the guidelines and promoting their adherence, the Diabetes Control Program was also interested in evaluating adherence to the guidelines. Subsequently they awarded a grant to the SMS Center for Medical Practice Research and Education to measure how closely patient care follows the guidelines.

The SMS formed a study group of internal medicine, endocrinology, family practice, opthamology, preventive medicine and public health specialists to accomplish that charge. The study group began meeting regularly in November 1999 and is developing a research protocol for measuring EDMG adherence.

Melissa Meredith, MD, Madison, chairs the study group. We are recruiting physicians, medical groups and clinics who are interested in learning more about participating in this study. *For more information, please contact Debbie Rickelman at 608.257.6781, or e-mail debbier@smswi.org.*

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Get Smart About Antibiotics: There's No Excuse for Overuse!

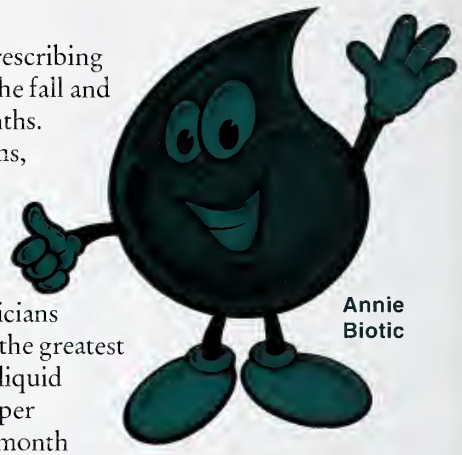
The SMS has partnered with the Marshfield Medical Research Foundation and the Wisconsin Division of Public Health to form the Wisconsin Antibiotic Resistance Network (WARN). The five-year, US Centers for Disease Control and Prevention (CDC)-funded project's goals are:

- Reducing inappropriate antibiotic prescribing in primary care by 25 percent;
- Reducing prevalence of antibiotic-resistant *Streptococcus pneumoniae* by 25 percent; and
- Decreasing the proportion of adults and parents who expect antibiotics for cough, cold or flu by 25 percent.

The project, which began in December 1998, spent its first year conducting baseline surveys to measure the general public's knowledge, attitudes and behaviors about upper respiratory illness and antibiotic use. The surveys showed that parents of young children are misinformed about the differences between bacterial and viral illnesses, and often do not know when antibiotics are warranted. For example, 78 percent of parents stated that antibiotics are always or almost always needed for bronchitis; however, bronchitis is viral in origin. Also, 38 percent of parents stated that discolored (yellow or green) nasal discharge always or almost always warrants antibiotic therapy; however, nasal discharge thickens and changes color as a normal part of a viral cold.

Primary care physicians, nurse practitioners and physician assistants were also surveyed by mail to assess factors that influence antibiotic prescribing. When asked if they could reduce antibiotic use in their practices without negatively impacting the quality of patient care, most respondents stated that on average, they could reduce antibiotic prescribing by 16 percent.

Additionally, a dataset was purchased from IMS Health to calculate the total volume of liquid and solid antibiotics prescribed in Wisconsin and to measure trends in antibiotic prescribing. In 1998, 617,461 prescriptions for liquid antibiotics and 1.66 million prescriptions for solid antibiotics were written. Prescribing peaked in the fall and winter months. Pediatricians, family practitioners and emergency room physicians prescribed the greatest number of liquid antibiotics per prescriber-month (37.7 prescriptions, 8.8 prescriptions, and 8.2 prescriptions, respectively).



Information from these baseline assessments led to the development of educational materials and interventions for the public and health care professionals, including:

- Brochures, posters, stickers, and coloring sheets, which are being distributed to clinics, managed care organizations, health departments and child care centers;
- Educating staff at large group day care centers about appropriate antibiotic use and antibiotic resistance;
- Participating in health fairs and other community events with the WARN mascots, "The Anti-B's;"
- Developing and distributing evidence-based clinical practice fact sheets on upper respiratory illnesses for primary care physicians; and
- Holding a satellite conference in October 2000 to discuss management of pediatric respiratory illness in the era of antibiotic resistance.

Educational activities for the public and health care professionals began in October 1999 and will continue through 2002. The project will be evaluated by repeating the knowledge, attitude and practice surveys described above and by comparing prescribing rates for liquid and solid antibiotics in 1998 and 2001. Additional evaluation measures include ongoing surveillance of invasive pneumococcal isolates to measure changes in rates of antimicrobial resistance and economic analyses of the interventions conducted during the project.

For additional information, contact Edward Belongia, MD, Principal Investigator, 715.389.3783, or Paula Keller at 800.362.9080, e-mail paulak@smswi.org, or visit www.wismed.org.

SMS offers array of publications

A number of brochures and manuals are available from the SMS. Most are intended as useful physician-education tools on socioeconomic and legislative topics; others serve as patient-education materials on a variety of medical issues. Some are available free of charge, while others require a nominal fee. Contact the SMS staff person listed for more information and/or to order publications at 800.362.9080, or in Madison, 608.257.6781 or visit www.wismed.org.

Physician and Staff Education Tools

Anatomy and Physiology - $29 + tax. This manual reviews the basics of body structure and function including both normal and pathological conditions. It provides a basic understanding of problems commonly encountered in health care settings and, combined with medical terminology, provides the foundation needed for accurate reimbursement coding and medical chart entries. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Blood Lead Screening and Treatment of Lead Poisoning in Children – A Wisconsin Physician's Guide - free. Published by the Department of Health and Family Services in 1999 and endorsed by the State Medical Society. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

Child Safe Information - free. Brochures, gun safety checklists, matching grant forms, bike helmet and firearm trigger lock information. *Contact Dan Klabunde, Lakeside Association Services, dank@smswi.org; or Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

Closing a Practice - free. Article from *WMJ*,1997. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Domestic Violence - free posters, model protocols, training videos, elder abuse guidelines, etc. are available from the SMS. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

Getting Acquainted with Managed Care - $29 + tax. This manual is designed for those at the entry level of the managed care arena. It will provide you with definitions of commonly used terms, contracting basics and much more. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Health Insurance 101 - $29 + tax. This handbook is designed to introduce the basics of the health insurance industry. Emphasis is placed on basic health insurance terminology, benefit interpretation, types of contracts and resolving claim problems. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

If You Have a Complaint about Medical Care - free. This brochure explains the SMS's grievance and peer review system. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Living Will and Durable Power of Attorney for Health Care Forms, State of Wisconsin - free. *Contact Sonia Porter, SMS Office of General Counsel.* Also available, *Gift to Your Family* consumer guide (free) containing background on living will, power of attorney for health care, DNR orders and organ and tissue donation. Produced May 2000. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

Medicaid Basics - $29 + tax. This manual is designed to provide basic information applicable to any provider specialty billing Wisconsin Medicaid. It contains an overview of the Medicaid Program, sample Medicaid ID cards and their benefit limitations, procedures for completing the HCFA 1500 for Medicaid reimbursement, Medicare crossover claim filing procedures and follow-up procedures. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Medical Professional Liability Insurance: Claims Made or Occurrence? - free. This brochure explains for physicians how the policies work, how premiums are established, how coverage is terminated, the limits of liability and deciding between the types of coverage. The brochure was produced by PIC Wisconsin. *Contact Alice Ballweg, SMS Insurance Services, Inc., aliceb@smswi.org.*

Medical Record Retention Information - free. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Medical Records and the Law - $29 + tax. This manual is designed for medical group managers and office personnel and covers all aspects of medical records management. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Medical Record Statutes - free. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Medical Terminology - $29 + tax. This manual is designed to introduce basic medical terminology. There is an emphasis on terms commonly used for insurance claims and coding. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org*

Medicare Part B Basics - $29 + tax. This basic manual is designed for those beginning to bill and file claims to the Medicare Part B program. It discusses the beneficiary enrollment procedure, step-by-step instructions on filling out the HCFA 1500 claim form, the appeals process, Medicare reimbursement and more. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Medicare Part B Database - $49 + tax. A paper copy of the Medicare Part B Fee Schedule Database (MFSDB) is available for purchase through the SMS. The listing includes conversion factor information, relative value units (RVUs), surgery indicators (global, multiple, bilateral, co-surgery, and team), and payable surgical tray information. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Medicare Part B Physician Reference Manual - $49 + tax - diskette version available for $29 + tax. This guidebook is designed to help the physician's billing staff stay on top of Medicare's policy and procedures. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Occupational Health Guide - $125. A completely updated edition will be available by August 1, 2000. This revised edition contains information for medical and nursing personnel in the commercial and industrial setting. Entitled "Your Body At Work," the guide includes information on medical directives, planning for medical emergency care, OSHA Bloodborne Pathogen Standards and universal precautions for transmission of HIV infection and tuberculosis. Special chapters include "Americans with Disabilities Act," latex allergy, special considerations for women in the workplace and many others. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org; or Merry Earll, SMS Professional Affairs, merrye@smswi.org.*

Office and Reception Skills - $29 + tax. This handbook is designed for front office personnel. It gives instruction on scheduling appointments, telephone etiquette, reception skills and interaction with patients. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

PartnerCare - free. A poster and brochure aimed at educating elderly low-income patients about this important SMS voluntary Medicare assignment program. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

A Physician's Guide to Wisconsin Health Law, Vol. IV – one copy free with membership. Additional copies may be purchased at a reduced rate. This handbook deals with the more important legal and socioeconomic issues affecting the practice of medicine in Wisconsin. The information in this book will help you avoid pitfalls, answer your patients' questions, ask the right questions when you need counsel, and become a more involved and effective voice for the profession. Published in 1997. Year 2000 revision will be available in the fall. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Physician Support Program - free. A packet for those facing malpractice mediation. *Contact Erin Warner, SMS Professional Affairs, erinw@smswi.org.*

State Medical Society of Wisconsin Policy Compendium: 2000-2001 Edition – Available on www.wismed.org. The compendium provides all SMS current policies. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org; or Erin Warner, SMS Professional Affairs, erinw@smswi.org.*

RBRVS Schedule - $21.50. The Medicare Part B Final Rule Federal Register. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Statewide Physician Health Program - free. This brochure offers information on the SMS's Statewide Physician Health Program. The program provides compassionate assistance to Wisconsin physicians suffering from any condition which may progress to impairment. A brief discussion of education, identification, assessment and

intervention is provided in this 1997 publication. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Successful Strategies for Patient Satisfaction - $29 + tax. This manual is designed to help physicians and staff communicate effectively with patients, co-workers and others. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Worker's Compensation - free. The SMS makes available to physicians several brochures and forms designed to ease the burden of worker's compensation cases. "The Guide for Wisconsin Doctors: Using the WC-16B for Worker's Compensation" and the booklet "How to Evaluate Permanent Disability" are available. The "Return to Work/Physical Capabilities" form, produced by the SMS Commission on Occupational and Environmental Health is available. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

Badger Care - free brochures and poster detailing the state of Wisconsin's new health insurance program for the working poor. *Contact Erin Warner, SMS Professional Affairs, erinw@smswi.org.*

Coding Publications

Introduction to CPT Coding - $29 + tax. This basic manual is designed for beginning coders. It stresses the rules and guidelines of the CPT book. There are beginning level exercises stressing the fundamentals. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Introduction to ICD-9 CM Coding - $29 + tax. This basic manual is designed for beginning coders. It stresses the importance of the ICD-9-CM system and introduces the guidelines necessary to use the system correctly. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

CPT Coding: The Next Step - $29 + tax. This manual is designed for coders with a minimum of six months coding experience. It reviews fundamentals and challenges the coder with a series of intermediate level problem-solving exercises to expand coding skills. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

ICD-9 CM Coding: The Next Step - $29 + tax. This manual is designed for coders with a minimum of six months coding experience. It reviews the basic fundamentals of the ICD-9-CM coding system and focuses on the ICD-9-CM rules through a series of challenging exercises. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

CPT & ICD-9-CM Coding: Annual Update - $29 + tax. This manual is intended for experienced coders and includes an intense series of advanced coding exercises designed to fine-tune coding skills. It will also reinforce coding guidelines and sharpen ICD-9-CM coding skills to provide the highest quality diagnostic information needed to enhance reimbursement. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Evaluation and Management Coding - $49 + tax. This manual is designed to help coders understand the CPT Evaluation and Management (E/M) codes. The manual contains exercises to stress the necessary information needed to use the E/M codes correctly. *Contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

In addition to the coding manuals listed above, the SMS Division of Education Programs and Services offers a variety of specialty-specific manuals. *For more information, please contact Gina Buettner, Educational Programs and Services, ginab@smswi.org.*

Patient Brochures

BadgerCare Brochures/Posters - free. BadgerCare posters for medical offices and patient-oriented brochures in English, Spanish and Hmong are available through the SMS. BadgerCare is Wisconsin's state program to provide health insurance for uninsured working families. *For more information on the program and brochures and posters contact Erin Warner, SMS Professional Affairs, erinw@smswi.org.*

Seat Belts – free. Posters and fact sheets on seat belt use and primary seat belt enforcement legislation. *Contact Lynn Sherman, SMS Professional Affairs, lynns@smswi.org.*

UCR, A Patient's Guide: How Much Will My Health Insurance Pay? - 10 cents per copy. This brochure explains what "usual, customary and reasonable" means, how misunderstandings can be avoided and how problems can be resolved when they occur. This brochure is suitable for enclosure in office statements or for placement in patient reception areas. Revised in 1998. *Contact Merry Earll, SMS Professional Affairs, merrye@smswi.org.*

Services

Consulting Services – SMS staff is available for on-site consulting on issues ranging from chart review, corporate compliance program development, physician coding profiling and more. *Contact Karen Carney, Educational Programs and Services, karenc@smswi.org.*

Hospital Medical Staff Bylaw Review. *Contact Melanie Cohen, JD, SMS Office of General Counsel, melaniec@smswi.org; or Ruth Heitz, JD, SMS Office of General Counsel, ruthh@smswi.org.*

Managed Care and Physician Employment Contract Review. *Contact Melanie Cohen, JD, SMS Office of General Counsel, melaniec@smswi.org; or Ruth Heitz, JD, SMS Office of General Counsel, ruthh@smswi.org.*

Mediation - Brochure/service free to patients who have quality of care complaints. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

On-Site Customized Education – SMS staff can provide physicians and their staff with practice management education designed to meet specific needs. *Contact Karen Carney, Educational Programs and Services, karenc@smswi.org.*

Peer Review Service provided, by contract, to physicians, hospitals or clinics for objective medical peer review for quality of care. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

Statewide Physician Health Program - free to SMS members. Intervention for alcohol, other drugs, senility, etc. *Contact Sonia Porter, SMS Office of General Counsel, soniap@smswi.org.*

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Five reasons to represent your SMS

Why Media Matter

By Steve Busalacchi, Director, News & Information

"I can't believe all the people who listen to that radio show," said an especially enthusiastic John Riesch, MD, former SMS President, a few hours after having discussed prostate cancer on a Wisconsin Public Radio call-in program. Patients and friends had been telling him all afternoon that they listened to the program.

The reach of the media is phenomenal, just one of several reasons SMS physicians should welcome media opportunities.

Why get involved?

1. Your message gets broadly disseminated. After a single 10 to 15 minute interview, the resulting story may reach 160,000 people or more. That's a sold-out crowd at Camp Randall stadium—twice over. Imagine how many lives you might affect.

2. The profession is elevated. Appearing as an expert quoted in a newspaper article, featured on a television news program or on the radio not only helps polish your professional image, but that of your SMS as well. When people, including state legislators, hear SMS physicians offering their medical expertise for the good of the public, they can't help but be appreciative. In addition, they will be more likely to seek and act on the profession's advice regarding policy matters that affect patients and physicians.

3. There's a thirst for health care information. Surveys find medical information is highly prized by the public. With the advent of the Internet, health care sites are among those that receive the most hits. Given that, the profession has a responsibility to make sure accurate information is available to the public.

4. It's easy. You will only be asked to discuss a topic in which you are well versed. Contrary to popular belief, this does not mean you must be an international authority. I am frequently amazed at how often physicians underestimate their training and experience or think they need reams of background to do a short interview. Most of the time, reporters are looking for an educated opinion from a local source, in a timely manner.

5. It's fun! The vast majority of physicians who do interviews enjoy the experience. Perhaps you've never been on the set of a television station before or done a live radio program fielding questions from people from all over the state. It can be exhilarating.

In the news

Media participation by SMS physicians is very good. Through their commitment, the SMS earned more than $600,000 in broadcast media value alone in 1999.* Even so, it can be better.

Just believing physicians can play an important role through the media will not get you on television or in the newspaper. Sometimes you'll have to juggle your schedule or make a patient wait a few minutes. By definition, reporters usually call at the last minute. You'll rarely get a week's notice. And no matter how dedicated you are to representing your SMS, there may be times when it's virtually impossible to break away for a phone call. Understood.

If you're serious about educating the public via the news media, taking these four steps virtually guarantees you'll have an opportunity.

1. Become part of the SMS speakers' bureau. If we know what issues you're most interested in, we'll have a better chance of finding the right source quickly. *Call SMS, ext. 229 or e-mail steveb@smswi.org.*
2. If you don't have e-mail, get it. It is the easiest way for busy professionals to communicate and exchange necessary information.
3. Direct staff to immediately pass on media messages. It's on to the next physician if there's no response in 30 to 45 minutes.
4. Provide a direct phone number. A lot of time is spent bouncing around from a main number to the physician's actual office.

Being represented in the media doesn't just happen. We must work together to match the right physician with the right story. Your SMS plays an important role. News reporters know this is a reputable place to find knowledgeable sources. But as any media savvy person will tell you, it takes flexibility on the part of the physician—a major reason Dr. Riesch achieved prominent media coverage during his tenure as SMS President. I look forward to working with many more of you.

**The amount it would cost to buy the airtime devoted to the issues explored.*

Lockhart: Teamwork a winning strategy for patients, physicians

Jack M. Lockhart, MD, demonstrates a yo yo trick during his presidential farewell address at the SMS Annual Meeting.

Good afternoon. It's nice to be here in Milwaukee. And not just because of the beer and bratwurst. This is actually a homecoming for the State Medical Society of Wisconsin, as well as for me. I attended my first SMS Annual Meeting some 23 years ago, here in Milwaukee.

More notable, though, the Society's first headquarters was established here in 1923, a short distance from this hotel, at 558 Jefferson Street. Of course, Milwaukee is not only the original home of SMS Headquarters. It's also the *current* home of the Bucks and Brewers, as well as many of our SMS members. Whether you live here in Milwaukee or in La Crosse, Ashland, Racine or Green Bay – or somewhere in between – you've chosen to practice and play on the State Medical Society's team. A *strong* team. A *growing* team. And yes, a *successful* team.

Hard work eventually leads to victory, in and out of the sports world. I'm proud to say the State Medical Society *has* worked hard and has enjoyed its share of success over the past year. But it wasn't easy. Our opponents were bigger, stronger, and initially, more influential. That brings me back to when I began my tenure as your president.

One year ago, I began my acceptance speech by telling you about one of my favorite movies—*Hoosiers*. It's about a small Indiana basketball team that beat all odds to win the state championship. I chose that story to exemplify the self-sacrifice, hard work and commitment that's necessary to succeed. Especially when you're the underdog.

Well, we were way behind, and the clock was running out on what quickly became the Society's top priority: patient privacy. Let me set the scene.

In April, the data bill was signed into law with full backing from big business and big labor—groups that rarely see eye-to-eye. But those warring factions actually agreed on this bill, so the issue was not seen as controversial. Little controversy meant little news coverage. It's that simple. So the public was largely unaware of what was passed.

Nevertheless, the bill's scope was massive, touching every clinic visit, every medical problem, every patient and every physician. It required doctors to report private medical information from all of their outpatient visits—300 million per year—to a state computer bank in Madison.

Hard as it is to believe, personal medical information could be *sold* to employers and the public, including the patient's city, zip

"So we channeled our passion, steadfast in the belief that privacy must prevail and mounted an offensive that Bucks Coach George Karl would be proud of... Patients and doctors prevailed in overtime... by working together."

code and phone number. How difficult would it be to put the pieces together to identify patients who worked for small companies? You could toss patient privacy right out the window. Under threat of fines, physicians were to hand over that medical data without the patient's consent.

This would have incensed my father, who practiced family medicine for 40 years. To him, patient confidentiality was sacred. He passed on that sentiment to his son. And I was heartened to learn that you, my colleagues, felt the same way, because this data law sparked a full-court press by SMS physicians. And we didn't let up until patients had their privacy back. Physicians and patients across Wisconsin said no. This law was simply too outrageous to accept without a fight.

A before and after insurance form shows what a tremendous service the State Medical Society provided for patients by insisting that they at least have the right of consent before their private medical information leaves our offices. Under the original data law, almost everything about the patient's visit was fair game and reportable to the state. You can get a sense of that by glancing at the HCFA insurance form displayed on the screen. The white blanks mean that information had to be sent in and be available to anybody who requested it.

Now let's see what the form looks like *after* we forced the compromise that negated the need for patient consent. All that darkness means the legislature finally saw the light!

The blacked-out sections mean no identifying medical information can be sent in the first place. No privacy will be lost. And no law will force physicians to violate their oath to maintain patient confidentiality.

This data law struck at the core of what we do, at the very heart of being a physician. We knew instinctively that this law would lead to a loss of patients' trust, and inevitably a loss of good medical care, too. So we channeled our passion, steadfast in the belief that patient privacy must prevail, and mounted an offensive that Bucks Coach George Karl would be proud of. I know I was.

We had the opportunity to act because Governor Thompson called a crucial time-out that gave us a chance to plan and execute our game plan. Although he did sign the data bill into law, the governor did not fund the positions to implement the law, thereby delaying the start date. Physicians across Wisconsin knew this was their chance and made the most of it. The State Medical Society garnered forces from every corner of the state, with members contributing in a variety of ways to support bipartisan patient consent legislation sponsored by State Representatives Scott Walker and Mark Meyer. Some physicians stopped by at the local paper to inform the editorial board about the privacy implications. Others did radio and television

"We have helped create a legacy that will result in less misery and longer lives for patients who might otherwise succumb to tobacco's sickening seduction."

interviews, which included powerful testimony from patients. And lots of people — doctors and patients — wrote or called their legislators to urge them to support patient-consent legislation. Your State Medical Society, meanwhile, acted as Command Central, organizing, overseeing and optimizing the efforts of physicians and their patients. Public affairs staff recruited and informed lawmakers about the necessity of co-sponsoring the consent legislation. Our communications department designed the eye-catching patient education brochures that were distributed to SMS members to place in their waiting rooms. And an SMS staff member single-handedly helped to educate thousands of people in the Greater Milwaukee area by volunteering the use of her private medical information. Radio talk show host Charlie Sykes used an actual insurance form from her doctor visit to demonstrate how this patient's medical privacy could be lost.

Together, these measures changed the momentum of the game. Suddenly, the data law supporters were in a defensive position while doctors and patients charged forward.

Pauline Jackson, MD, receives the SMS Presidential Citation Award from Jack Lockhart, MD. Doctor Jackson was recognized for her tobacco prevention efforts. As president of the SMS in 1993, she focused on anti-smoking programs directed toward children, teens and pregnant women. Her work as president still influences many of the efforts of the SMS today. Also pictured: Mark Andrew, MD, SMS Board Chair.

Patients and doctors prevailed in overtime when every major special interest group towered above us. How? By working together. By not giving up. By not conceding our principles. In short, by self-sacrifice, hard work and commitment.

Working together was key to our *other* successes, as well. The State Medical Society stood squarely behind patients in the fight to secure that doctors, not accountants, determine their best treatment options. An entire delegation of SMS officers, myself included, traveled to our nation's capital to support the patient's bill of rights, which passed overwhelmingly in the US House. With continued vigilance, we will succeed in passing a similar bill through the Senate so it can be sent on to the president for his signature.

The State Medical Society is not only working for patients by traveling to Washington, but by contributing at home, in Sheboygan, West Bend, Eau Claire and many other communities. Our members have enthusiastically volunteered to go to middle school classrooms across the state to teach children about the dangers of tobacco. The State Medical Society's "Smoking: Truth or Dare?" program is such a hit, it's garnering front-page news coverage. It also has caught the attention of the law firm that negotiated the State of Wisconsin's

"The State Medical Society stood squarely behind patients in the fight to secure that doctors, not accountants, determine their best treatment options."

tobacco settlement as well as the attention of the Smokeless States Project. Both organizations awarded grant money to the Society to support "Smoking: Truth or Dare?".

But more importantly, it's scaring kids straight. We're showing them the real-life effects of smoking, thanks to a wonderful television program SMS sponsored and is now continuing to share in small classroom settings.

On another front against smoking, the State Medical Society worked with numerous health organizations to more than quadruple the funding that was originally proposed in the state budget for smoking prevention programs. Now, a substantial amount of money from the state's tobacco settlement will go toward prevention and cessation activities. We have helped create a legacy that will result in less misery and longer lives for patients who might otherwise succumb to tobacco's sickening seduction.

Prevention is also at the heart of the antibiotics education campaign the State Medical Society began last year by partnering with the Marshfield Medical Research Foundation and the State Division of Public Health. Last fall, we began the public education part of our effort to remind patients and physicians that antibiotics must be used wisely for them to remain strong and effective. Like our anti-smoking efforts, generations to come will benefit from the State Medical Society's leadership on wise antibiotic use.

We will have an even greater effect on health care when more physicians join with us. Our goal must be to include as many of our colleagues as possible in our Society. And that means breaking down the barriers that prevent them from joining us. Here in Milwaukee, the state's most populous city, we have the greatest potential to build membership. Our membership has been on a steady decline to the point that we now represent barely 50 percent of the eligible physicians in the area. We know through surveys and through personal experience that the cost of dues remains the most common reason cited for not joining with us. We must take this feedback seriously and make changes that can bring down the cost of membership. We must work harder to eliminate costly duplication of services. And we must pursue ways to create alternate membership options that will better serve our colleagues. When we accomplish these things, more physicians will recognize the value our Society offers and gladly join with us.

Partnerships, collaboration, team work. They can be linked to all of our successful endeavors, from "Smoking Truth or Dare?" to our privacy campaign. That's how the State Medical Society progressed last year, and it's how we'll progress every year hereafter. Because we care enough to make sure our patients' welfare is never compromised—no matter whom we're up against. Thank you.

Samadani: Reaching out, acting together keys to medicine's future

Ayaz Samadani, MD, addresses SMS members and guests during his inauguration ceremony.

Good evening. I have great respect and gratitude for all of you who have bestowed upon me the privilege of representing Wisconsin physicians as the 147th President of the State Medical Society of Wisconsin.

My family and friends join me tonight in celebrating this deep honor. I would like to take few minutes to introduce my wife Farah, my daughters, Rosina, from New York, Asma joins me from London, Uzma, and her husband Yusuf, from Philadelphia; my son Mahin from San Francisco; and my youngest, Nadia, joins me from Florence, Italy. My sister Zia and her children, my brother Tahir, his wife and children. My father-in-law and mother-in-law, Mr. and Mrs. Khan. My sister-in-law Naheed Arshad and her son, my other nephew and nieces, my friends and guests from Beaver Dam and out of state.

As they are joining me tonight, I can't help but reflect on my journey to this point. A journey from Pakistan to Beaver Dam, Wisconsin.

You may wonder, how did a physician from Pakistan end up practicing in the American Midwest? Well, I will admit it wasn't the attraction to the brats or the beer. I don't indulge in either. I came to Beaver Dam looking to buy land for hunting. It was the Beaver Dam town banker who said that Farah and I should consider moving to that wonderful little town and open up a practice.

Even though we had lived in many big cities around the world—the United States was still quite a culture shock. Everything is so big here. Big four-door cars. Gallons of milk instead of pints, boxes of butter instead of buying them one stick at a time. But the size of everything was also matched by the size of everyone's heart.

In 1971, we moved to Beaver Dam and started my practice. I would like at this time like to acknowledge the loyalty and support that I have received from my office staff. Joanne Vaughan, who was with me when I saw my very first patient almost 30 years ago; Sandy Affeldt, who has been with me for 23 years to date; and Debbie Rennhak, who joined my staff just under two years ago.

But there was life before Wisconsin.

My journey started in the village of Samadani, yes, Samadani, as in my name, in Pakistan many years ago. I remember as a young man, my father impressed upon me the importance of education. However, because of my father's position in our village, the teachers often gave his children what were called "grace marks." Teachers who wanted to curry favor with my father would show him final grades that were excellent. But my father, a smart man,

"Partnerships, collaboration, teamwork. They can be linked to all of our successful endeavors, from 'Smoking: Truth or Dare?' to our privacy campaign."

was never impressed. He always asked to see our day-to-day grades, the daily classroom log. He wasn't interested in grace marks, he was interested in hard work. He challenged us to challenge ourselves.

In my culture, a parent's advice is always held in very high esteem. It's never questioned. When I was young, my father told me that he had hoped and prayed for my future as a physician. From boyhood on, I always believed that my purpose here on earth was to be a physician, a healing hand and a tender heart, and a voice to serve others and now also to serve you, my colleagues.

My service to others began in volunteer eye camps in Samadani. Twelve year-old Boy Scouts like me guided patients to the operating tent. The memory of that tiny contribution carried me through medical school and postgraduate education in England.

My service continued in some of the most impoverished areas in the world – from Madagascar to Istanbul and from the Mecca to London. Through the course of these journeys, I have also discovered that illness has a universal language. Regardless of where we are in the world, as physicians, it is our dedication and ability to help and serve others that offers such a tremendous opportunity to touch lives and reach hearts.

If illness is, in fact, a universal language, then this year's Annual Meeting theme "In Step with the Changing Face of Medicine" is most fitting. At no other period in history have physicians of all race, denomination and even gender – brought greater diversity to our field. Fifty years ago women physicians were only 6 percent of practicing physicians. Today, almost half of all medical school graduates are women. The SMS needs reach out to women, IMGs, residents, academics and students to make our collective voices truly representative of the diversity that exists in the field of practicing physicians today.

I am proud to be part of this diversity—one of 154,000 IMGs in the USA. Tonight I say thank you for the confidence you have placed in me as we move forward, "In Step with the Changing Face of Medicine."

But moving forward will involve much more than incorporating diversity. We must become familiar with the digital revolution. A patient of mine, who has had no means to communicate since birth, sent me an e-mail one day from his computer. I was absolutely amazed. He communicates with the help of a light beam on his glasses, which he points to a screen to get his messages across and to surf the net.

We should all have his determination to participate in the digital revolution. We all know it will become even more important to communicate with one another as time goes on. The speed of time is now only relevant in terms of what is called real time. We know a byte isn't something you take, and a cookie isn't what you bake and a chip isn't something you eat.

"Regardless of where we are in the world, as physicians, it is our dedication and ability to help and serve others that offers such a tremendous opportunity to touch lives and reach hearts."

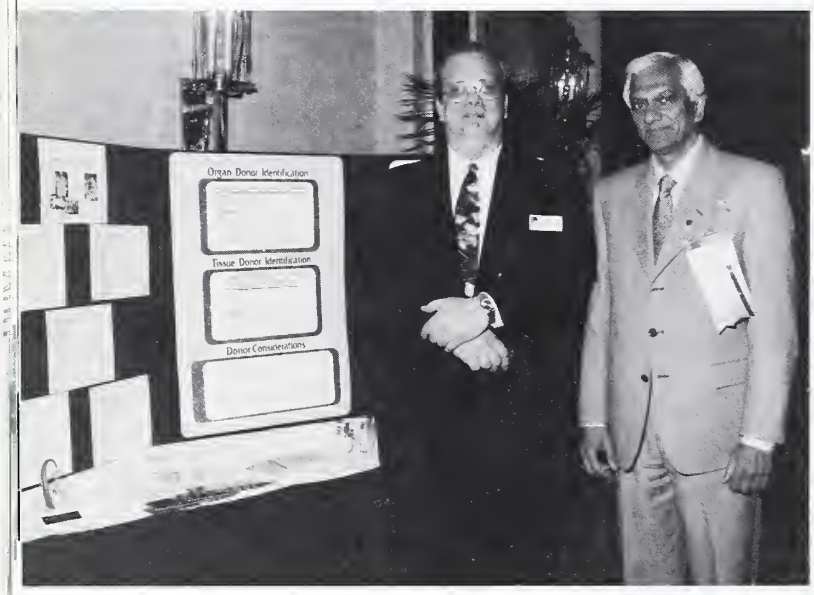
We also know that in an SMS survey of physicians two years ago, only one in five said that e-mail was a preferred communication method. According to a recent survey of the SMS, nearly 50 percent of SMS physician members are now on-line using e-mail as a way to communicate with others more expeditiously.

As a result, the SMS has put considerable effort into increasing on-line communications, and currently we are organizing a physician directory to post on its site. We know to be effective, to make a difference, that we must be in step with the latest communication technologies.

We need to take advantage of the speed that participation in our association, legislative matters and other meetings requires if we want to remain players.

And we are all players, that I can assure you. We fought long and hard last year, both nationally and in this state, to protect our patients' right to privacy. When our patients tell us things that they don't want others to know we honor their confidence in us. You should be very proud of that victory. Working together, we succeeded, but there is still more to do.

There will be many issues we must face as we move forward this year. I will need each and every one of you to be aware that our collective voice is what makes us powerful in today's world, not our individual beliefs. The market and political climate today have competitors and voices much louder than ours that would like to tell us what ultimately we know best. The SMS and the AMA need your collective wisdom and participation to address many issues. Among them are licensure issues in telemedicine; equity issues in Medicare and Medicaid reform; quality care being driven by cost; more data collection and policy initiatives to reduce medical errors widely reported in the media in recent months.



Mark Larson, of the Eyebank of Wisconsin, spent a day at the SMS Annual Meeting talking with physicians about eye donation. Several organizations were at the meeting to help Dr. Samadani educate physicians about the need to talk with patients about organ and tissue donation. Also there were the UW Organ Procurement Organization, Wisconsin Donor Network, National Kidney Foundation of Wisconsin and the Wisconsin Tissue Bank.

We must also continue to work for better access to health care, not only for those who can't afford it, but also for the uninsured. We must also continue to expand on focused outcome studies such as two current studies on lower back pain and asthma.

We must continue to fight for the appropriate use of the millions of dollars in tobacco money that Wisconsin will receive. We need to be much more vocal in our belief that tobacco money should be set aside in a special endowment fund to deal with prevention issues. When the legislature spent the tobacco settlement money this past year before it even arrived in Wisconsin on property tax relief, we lost. Yes, we won in court, but we lost politically. We need to reaffirm our commitment to advocate without any shadow of a doubt in the Wisconsin legislature to spend

"Our collective voice is what makes us powerful in today's world, not our individual beliefs...The SMS and AMA need your collective wisdom and participation to address many issues."

this money for the benefit of generations to come.

In step with the changing face of medicine, we must also realize that greater access to information and choices for patients will impact us. Eventually, patients may choose a physician after an on-line search. Cyber citizens, regulators who want to know who we are and how we practice, will be linked to us through information on the Internet. We will need to stay informed of what is being said about us. Special interest groups such as insurance companies and those who drive health care decisions on cost alone will be communicating in increasing numbers with elected officials. We must be ready to influence this process.

All these issues are part and parcel of our strategic plan. Again, we must be vigilant in our efforts to protect and serve the needs of our patients. We must actively voice our concerns to defeat policies that would allow others to tell us how we should practice medicine.

Also, there is another way I hope we learn to use our voices. We must talk to our patients about organ and tissue donation. My goal as SMS President is to increase awareness and draw attention to the need for physicians to do a better job of encouraging organ and tissue donation by their patients.

Despite the fact that we have two outstanding organ procurement organizations in Wisconsin, far too many people are still on waiting lists and far too many people die before they receive the organ or tissue that could help them live. There are 67,000 Americans waiting for one chance of a lifetime. No less than 5,000 potential donors die each year without getting a chance of being asked to donate.

People on the waiting list are dying—one every two hours. You and I, along with our patients, can make a difference, but we have to combine our efforts.

Look for many activities this year to help physicians become more comfortable talking about life issues when patients come to see you for a routine check-up. By the end of this year, I hope that we will greatly reduce the waiting lists in our state. Call the OPOs and find out what you can do to become a better resource for others. I am asking for your help.

"Be a donor and build hope." That is what we must tell our patients. This message, however, must start with us. In addition to signing our own organ donor card or being sure that we have specified ourselves as organ and tissue donors in our own end-of-life planning, we must talk about these issues with our patients. Surveys have shown that physicians, for the most part, are uncomfortable talking about end-of-life matters, because it is our job to make people well. This is where we need to use the expertise and services that are available through this Society, the AMA and our two fantastic organ procurement programs to find out what we can do to reduce the waiting list. We need to tell our patients "be a donor, build hope."

A few years ago I was taking care of a world-renowned musician who was an end-stage diabetic. He needed a kidney transplant. In desperation, he called me and then he waited and

"People on the [organ donation] waiting list are dying – one every two hours. You and I, along with our patients, can make a difference, but we have to combine our efforts."

waited. By the time a donor was found for him, it was too late. A wonderful man, a talented man, a friend who died way too young.

When Chicago football great Walter Payton died last year, his death created a surge in liver donations for a while. But we shouldn't have to wait for sports heroes or celebrities to help us do a better job of communicating this need to our patients. Ask yourself how often you ask your patients, "have you ever thought of being an organ or tissue donor?" It's that simple.

Have you ever thought about how our body and mind work together day after day in harmony and cohesiveness? If one becomes independent, what happens? We can develop twitches or have seizures. In this similar harmony of function, we have to expand beyond our bodies and our intellect in our profession and in our society. We need to be interlinked and bridge builders to give others hope.

Hope is sometimes our strongest ally when a person hangs between life and death. I knew of a beautiful 17-year-old school girl who came down with a respiratory tract infection and within days became lethargic and jaundiced, only to be diagnosed as having acute liver failure of unknown cause. Her choices were quite limited. It wasn't until she was kept alive by a pig's liver for three days that she received a gift of her lifetime – a healthy human liver. She's here today. Please, Mrs. Becky Cira, stand up.

Ayaz Samadani, MD, takes the presidential oath of office at the SMS Annual Meeting. Doctor Samdani is the first international medical graduate to serve as president of the SMS. Also pictured are Past President Jack Lockhart, MD, (right) and Mark Andrew, MD, Board Chair, who gave the oath.

Her message and my message are clear. We must become the voices that tell others they can make a powerful difference with a simple act of kindness that will help them live on after they pass away.

I need each physician here tonight to help me to be a builder of perseverance and hope. Let us reach beyond grace marks. Let us hold ourselves to a higher standard of accountability. There is a wonderful expression I'm sure many of you have heard—"the more you give, the more you live." In this instance, the more others will live too.

I look to all of you tonight, to join with me for an exciting year.

But tonight let us celebrate -- among family and friends—our many accomplishments from this past year. Tomorrow, let us embark on untraveled paths that will take us even further than we traveled this year.

In closing, keep in mind the advice I know my father would have offered us tonight. As physicians, we cannot rely on "grace marks" as we move forward this year. Our real accomplishments will come from our day-to-day efforts to make this organization more effective with more members.

I look forward to the journey with you. Let's celebrate!

Patchett: SMS has will, way to lead health care agenda

SMS Executive Vice President John E. Patchett, JD, addresses the House of Delegates during the SMS Annual Meeting.

Poet Eliza Cook, who lived in the 1800s, once wrote:

"We have faith in old proverbs full surely,
For Wisdom has traced what they tell,
And Truth may be drawn up as purely
From them, as it may from 'a well.'
Let us question the thinkers and doers,
And hear what they honestly say;
And you'll find they believe, like bold wooers,
In 'Where there's a will there's a way'."

Where there is a will there is a way. I remember my mother and father telling me this, or some variation of it, often – especially when our family, or I, may have been struggling.

In several ways, our SMS family has been struggling the last few years. Dealing with the many changes that have occurred in health-care delivery, the changing faces of physicians and the organizational changes needed to move forward. Entering an era Tom Peters describes as "a patient-centric health care" – where there is a true doctor-patient partnership increasingly, with patients in control and physicians acting as their expert partners. This is, indeed, challenging.

But as the poem says, wisdom, truth, and honesty can help us find the way. As we have struggled, we have relied on the wisdom of our leaders, our history and our members. Wisdom, though, leads you to truth. And facing the truth can be difficult, especially when it means change. But remember, "A bend in the road is not the end of the road – unless you fail to make the turn." And we are making the turn.

Wisdom is at the heart of our strategic plan. Where truths gained, both from within and outside of the organization, have led us to assess the SMS honestly.

We envision a future with SMS as the leader in Wisconsin in patient advocacy and health policy decision-making. When we are honest with ourselves, however, we know, at times, that we are not. *But where there's a will, there's a way.*

We also say that we must be an organization physicians believe is essential. The truth is, we are not always regarded as essential because a third of the physicians in this state are not members. *But where there's a will, there's a way.*

Our way has been the strategic plan. And our will is great. Our successes this year demonstrate just how willful we can be when we focus on leadership in health policy and on becoming essential.

"No bond, though, was more powerful than the partnership you have with your patients. Working together, physicians and patients sent a strong message to the legislature: 'We still trust our doctor'."

And, it is clear that to be the health policy leader, we have to open our minds and our arms. We learn each time we do. Our efforts have only been strengthened through our collaborations and coalitions.

An excellent example is our will to protect our patients' privacy. Our patient-consent campaign started out as quite a lonely one, but as we partnered with specialty societies, patient groups, key legislators, such as Representative Scott Walker, and the media, our voice grew. No bond, though, was more powerful than the partnership you have with your patients. Working together, physicians and patients sent a strong message to the legislature: "We still trust our doctor." Thanks to all of you, working together, *Where there's a will, there's a way.*

We have continued to build patients' trust with the recent passage of independent external review legislation. This law would not have been possible without a collaborative approach. A coalition working with Representative Gregg Underheim and Senator Alice Clausing developed draft legislation, and things appeared to be proceeding smoothly.

Then, at the 11th hour, a dispute between the trial lawyers and the HMOs, complicated by tensions between the Republican leadership in the Assembly and the Democratic leadership in the Senate, threatened to derail our efforts. But your SMS stepped up to the plate, demonstrated leadership and brokered an agreement between all the parties – focusing on the patients – and this quickly led to a strong bill passed with overwhelming support in both houses. *Where there's a will, there's a way.*

Medical students have a voice at the SMS Annual Meeting. Future physicians listen to the debates during the House of Delegates meeting.

We've been working hard in our nation's Capitol, too. Working with the AMA and our congressional delegation, we helped introduce and move the Patients' Bill of Rights legislation, providing for many key patient protections, including accountability of health plans for their decisions. Versions of the bill have now passed both the House and Senate, and they are currently being considered in conference committee.

The SMS and the AMA have also been lobbying Congress to achieve Antitrust Relief for physicians. Legal barriers would be removed so self-employed physicians can jointly negotiate with health plans on key issues directly relating to patient care and the patient-physician relationship. By allowing joint negotiations, some balance will be returned to the process so that decisions driving patient health care are not inappropriately re-

"It is clear that to be the health policy leader, we have to open our minds and our arms. We learn each time we do."

stricted or unilaterally dictated by health plans. The good news: yesterday the House Judiciary Committee overwhelmingly passed this bill out of committee, and now it awaits debate on the House floor. Just a few short months ago, no one gave us much of a chance to accomplish this, but we have. *Where there's a will there's a way.*

In all of these legislative activities, your support, in the form of participation in our grass-roots efforts, and in your contributions to WISPAC and Physicians for Better Government have been absolutely essential. And one of our key goals during the coming months is to get all of you, and many more of your colleagues, to join in these as well.

In addition to these victories, another way the SMS is emerging as a health policy leader is by establishing our Health Policy Summits. For the first time, these bring together medical and specialty groups in an organized and ongoing fashion. This has sharpened our communications, enhanced our lobbying efforts and made us more proactive and effective. *Where there's a will there's a way.*

But we've just begun. Remember, success is a journey, not a destination. And we will continue this journey, actively pursuing leadership in health policy:

- By being proactive, not reactive
- By developing new health policy with a collaborative approach
- By being the party that *has* to be at the table when deals are made
- And most of all, by being *the* group known as our patients' advocate.

And these things will help us achieve the second component of our will – being an organization Wisconsin physicians believe is essential. Obviously, our patient advocacy and successes on the health policy front are instrumental in achieving this. But we are doing much more. And I am pleased to report it looks as though it's making a difference. Our membership numbers are up. From 64 to 67 percent. We still have a long way to go to approach our strategic membership goal, but at least we are now heading in the right direction. *Where there's a will there's a way.*

Our way includes reaching out to young physicians, female physicians, academic physicians, and medical groups.

New initiatives, such as the young physician dues category, have paid off in the form of increased membership. These physicians are the future of the SMS, and we need to continue our efforts to reach out to them – to become essential.

We are reaching out to women physicians – especially important now with young women accounting for half of all medical school students. We need to be essential to them. Working with our female members, we are creating a women's health summit for physicians to be held this fall. To date the response has simply been tremen-

"In today's world, our interests are much more alike than different. Being the health policy leader, and an organization physicians believe is essential, means hearing honestly."

dous, with many becoming involved in the SMS in a meaningful and active way, for the first time.

Our efforts also include reaching out to academic physician leaders, along with medical students and residents. We need to increase our respective understanding of each other. In today's world, our interests are much more alike than different. Being the health policy leader, and an organization physicians believe is essential, means hearing honestly.

The wisdom provided by the Board, through the development of the new Strategic Plan outline, has driven our decisions and our growth - leading the way to new heights and new endeavors. Those who gave of their time and knowledge to develop this Plan deserve to be congratulated for their fine work because your Strategic Plan is making the difference. *Where there's a will there's a way.*

Our vision for the future remains. The Strategic Plan will continue to guide our way. Our purpose remains steadfast – *advancing the health of the people of Wisconsin.*

Wisconsin has felt our impact as we reach out. Seek new allies. Develop new paths, initiatives, and partners. And the proof is in our successes. Besides those I've already mentioned, they include:

- Recognition of our outcomes research activities. The outcomes research has been a critical part of our efforts to advance patient health and enhance professionalism. And special recognition goes to the SMS Foundation. Its efforts and funding have allowed us to grow and expand.
- The highly acclaimed *Smoking: Truth or Dare?* Program brings physicians into junior high classrooms across the state. It has been presented to more than 5,000 students in over thirty schools in the past year. We are also being helped by grants from the Habash, Habash, Davis and Rottier Charitable Foundation, as well as the Smokeless States Project, to grow this important and effective program even more.
- As part of the nationally-followed WARN project, Moxi and Annie have been helping us educate the public and clinicians to reduce the unnecessary use of antibiotics and the prevalence of antibiotic-resistant bacteria. As Annie and Moxi remind us, "There is no excuse for overuse!"
- We are collaborating with the state on the SMS Online Physician Directory - which will provide information to the public on

Mark Andrew, MD, swears-in new Board members (from left to right) Edith McFadden, MD, Milwaukee, James Buck, MD, Brookfield, Susan Kinast-Porter, MD, Milwaukee, and Dan Sherry, MD, Ellsworth, at the beginning of the SMS Board meeting on Sunday, April 2.

"Our sphere of influence is expanding. Rather than *wondering* what is happening, we are *making* it happen."

every licensed physician in this state - and will provide for electronic links between physicians and patients. This is a tremendous public service to the people of Wisconsin.

- And, we are enhancing our communications efforts to the public. We continue to update our web site, and we have implemented *On-Air Health Care.* This service provides stories featuring SMS physician experts to Wisconsin radio stations, on important and timely health topics.

Where there's a will there's a way.

In the next year we will build on these successes, enhancing the role and visibility of physicians in this state. And achieving success is different in today's enivornment, compared to the past. I heard a great quote at the AMA's Leadership Conference this past week: "Success is not gained by perfecting the known, but by imperfectly seizing the unknown."

And we will continue to change the way we do business – to increase our impact – aggressively using communication and technology. We will work with additional groups, complementing their efforts as they complement ours. There is tremendous strength in building alliances.

We will continue reaching out to the physicians in this state who are not members of the SMS, meeting with them personally and letting them know about the tremendous benefits they will enjoy by joining their statewide association.

And most of all, we will continue in our efforts – in focusing all that we do – on *advancing the health of the people of Wisconsin.* We will do this in the health policy arena, in the media arena and in the public arena. A strong unified physician voice is the key. *Where there's a will there's a way.* Working together, physicians *are* determining the path of medicine.

Our sphere of influence is expanding. Rather than wonder what is happening, we are *making* it happen. We know we've made advances in health policy leadership and in membership. We have set out on our journey with a good map to follow – the Strategic Plan. Our path will be challenging because the ever-changing health care climate will require our constant vigilance to make sure that patients and physicians remain the most important piece of the health care debate. Our will will lead the way.

Eliza Cook's poem ends:

Should ye see, afar off, that worth winning,
Set out on the journey with trust;
And ne'er heed if your path at beginning
Should be among brambles and dust.
Though it is but by footsteps ye do it,
And hardships may hinder and stay;
Walk with faith, and be sure you'll get through it;
For "Where there's a will there's a way."

2000 House of Delegates Action on Board Reports

Resolution 1 directs the Society to support legislation that would make the Patients Compensation Fund voluntary; allow physicians to obtain coverage through commercial insurers and limit PFC assessments to increases in the cost of living. *Action: not adopted.*

Resolution 2 directs the SMS to: stop using the word "victory" to describe the data collection compromise included in the 1999-01 state budget; renew its campaign to stress the importance of the patient-physician relationship; and emphasize that the Society supports medical research but is opposed to compulsory medical data collection by the government or data collection that ignores the concept of consent. *Action: not adopted.*

Frank Salvi, MD, from Dane County Medical Society, testifies during a reference committee.

Resolution 3 directs the Society to oppose the enactment of any requirement for physician licensure which is not reasonably related to qualifications and fitness to practice medicine. *Action: not adopted.*

Resolution 4 directs the Society to work with interested parties to develop legislation that would: (1) utilize insurance claims data to estimate the difference in cost for motorcycle riders who wear helmets and those who do not; (2) allow a motorcycle rider to declare on a license application whether or not s/he uses a helmet; (3) charge an increased fee for motorcycle riders who declare that they will not use helmets; and (4) create a system of escalating fines, including forfeiture of the motorcycle, for any motorcycle rider who is stopped by law enforcement and is not wearing a helmet despite having indicated on the licensure application that s/he would wear a helmet. *Action: adopted.*

Resolution 5 and Late Resolution19 direct the State Medical Society to oppose and prohibit the use of restrictive covenants in physician employment contracts and request the SMS to offer counseling to physicians concerning restrictive covenants in employment contracts. *Action: referred to the Board of Directors.*

Resolution 6 directs the State Medical Society to initiate a major, on-going public relations campaign to warn the public about the dangers of socialized medicine. *Action: not adopted.*

Resolution 7 directs the State Medical Society to adopt a policy that hospital charges should be related to the actual costs to the hospital for providing a service. Hospitals should discontinue the practice of "unbundling" and then coding and billing for every item separately. Hospitals should seek voluntary charitable donations from individuals and corporations to make up any budget shortfalls. *Action: not adopted.*

Resolution 8 directs the State Medical Society to endorse placement of warning labels on bungee cords, encourage the mandatory use of safety glasses and work with the Consumer Product Safety Commission on adequate labeling of this product. *Action: adopted as amended.*

Resolution 9 requests that an organ donor registry be established and that preference for receiving an organ be given to those persons who have already registered to be a donor. *Action: referred to the Board of Directors.*

Resolution 10 directs annually that all officers of the State Medical Society of Wisconsin disclose, for publication in the *Wisconsin Medical Journal*, any and all affiliations with insurance companies,

or other medically-related businesses. *Action: not adopted.*

Resolution 11 directs that the SMS Bylaws be changed so that Society membership does not terminate with de-licensure, and directs that the SMS provide support and legal assistance to physicians who have been subject to prosecution or de-licensure. *Action: not adopted.*

Resolution 12 directs that the SMS ask the AMA to develop a cost effective system to display the reference committee item being discussed in each reference committee so that in each reference committee one can see the agenda item being discussed in the other committees at than time and that the AMA share or rent the technology to the various state medical societies for use at their annual meetings. *Action: adopted.*

Resolution 13 directs that county medical societies, specialty sections, and Board districts of the SMS that nominate Delegates and Alternates to the SMS House of Delegates and to the SMS Board of Directors, be encouraged to consider nominations which would broaden the diversity of physician leaders within the SMS and that the SMS House of Delegates Nominating Committee similarly be encouraged to consider nominations which would broaden the diversity of physician leaders within the SMS, that the SMS Board Districts be encouraged to nominate physicians to the SMS Nominating Committee, who would broaden the diversity of the composition of the Nominating Committee itself. *Action: adopted as amended.*

Late Resolution 14 directs that the State Medical Society of Wisconsin work to introduce legislation requiring that primary insurers pay for needed medical care up front and receive reimbursement from Workers Compensation later if the case is determined to fall under Workers Compensation responsibility. *Action: adopted as amended.*

Late Resolution 15 directs the Society to adopt a policy supporting: the development of a state supervised fund to compensate attorneys on a time and materials basis; the elimination of the contingency fee system in worker's compensation cases; rewards for attorneys who close cases within four months; and penalties for attorneys who fail to close a case within one year or file frivolous or fraudulent cases. *Action: referred to the Board of Directors.*

Late Resolution 16 directs the Society to adopt a position in support of allowing and encouraging the integration of worker's compensation coverage with health and disability coverage. *Action: referred to the Board of Directors.*

Late Resolution 17 directs the SMS to adopt a policy endorsing the adoption of the AMA Guides to the Evaluation of Impairment in place of current Department of Workforce Development statutes related to evaluating permanent disability in worker's compensation cases. *Action: referred to the Board of Directors.*

Late Resolution 18 directs that the SMS re-examine the territories assigned to field representatives and reallocate the territories based on a more equitable assignment of numbers of members and potential members. *Action: adopted as amended.*

Late Resolution 19 – *see Resolution 5.*

Late Resolution 20 directs the SMS to advocate for legislation to require regular physical education classes in Wisconsin elementary schools and further directs the Society to ask the American Medical Association to support the legislation. *Action: amended substitute resolution adopted.*

Late Resolution 21 directs that the House of Delegates instruct the Finance Committee to raise the Presidential stipend from $30,000 to $40,000 effective immediately and address raising the per diem reimbursement for members of the Board of Directors and members of the AMA delegation in the next fiscal year. *Action: referred to the Board of Directors.*

Late Resolution 22 directs that whether a patient currently uses, formerly used, or never used tobacco products should be a component of every comprehensive new-patient examination, and that our AMA should encourage all physicians to consider including questions about tobacco use status (including quantity, frequency, and route of administration) at every clinical visit, to commend all former users who have stopped, and to encourage all users to stop. *Action: adopted.*

Late Resolution 23 directs the Society to: encourage enactment of legislation which would create a public trust to receive and administer all future disbursements of the proceeds of the tobacco settlement; provide that the intent of the public trust is to make decisions about devoting portions of the tobacco settlement monies to cover the treatment and prevention of nicotine dependence and compensate the state treasury for state expenses incurred in treating tobacco-related illness; dedicate the tobacco settlement monies for initiatives related to tobacco prevention, control and cessation efforts; and prevent the infusion of settlement monies into the state's general fund. The resolution provides that establishment of a public trust shall be the number one public policy

priority for the Society in the 2001-02 legislative session. The resolution further directs the Society to offer a parallel resolution to the AMA's House of Delegates to encourage all state medical associations to pass similar resolutions in their states. *Action: substitute resolution adopted.*

Resolution 24 directs the State Medical Society to seek legislation prohibiting the requirement that patients must see the preferred provider in a given specialty when an equally qualified physician is available at a closer location. *Action: not adopted.*

Late Resolution 25 directs that the State Medical Society of Wisconsin support a request to the Bureau of Health Professions-Pharmacy Examining Board, Department of Regulation and Licensing, that a physician be able to delegate the authority to pharmacists to substitute a therapeutic equivalent drug, by noting on the prescription the phrase "per formulary" or "PF." *Action: not adopted.*

Late Resolution 26 directs that the State Medical Society encourage our elected representatives to the U.S. Congress to support, vote for and enact the Twenty-First Amendment Enforcement Act S 577/HR 2031 and that SMS be opposed to the obtaining of alcoholic beverages, from out-of-state vendors, in violation of state law, by minors. *Action: adopted.*

Board of Directors Reports

Report A: Task Force on Telemedicine. *Action: adopted.*

Report AA: Task Force on Level Playing Field. *Action: referred to the Board of Directors with a request for the Board to make annual reports to the House of Delegates for the next three years, as it relates to possible resolution of those issues.*

Report B: Medicare Bundling/Unbundling of Charges. *Action: adopted.*

Report BB: Paramedic Systems Changes in Wisconsin: Allowing One Paramedic Operations. *Action: adopted.*

Report BB: Prescription Drug Assistance for Seniors. *Action: adopted.*

Report BB: Prescription Transfers and Renewals. *Action: adopted.*

Report BB: Request by the Department of Transportation. *Action: adopted.*

Report BB: Policy on Gifts to Physicians from Industry. *Action: adopted.*

Report C: Task Force on Organ Donations: Organ Sharing, Donor Registry, and Sale of Human Organs. *Action: adopted.*

Report C: Physician Leadership on National Drug Policy. *Action: adopted.*

Report D: Medical School Directors. *Action: constitutional amendment laid over until Annual Meeting 2001*

Board Report D: Amendment to Constitution, Article XIII – Amendments and Board Report DD – *Revised Amendments to the Constitution and Bylaws adopted in lieu of Board Report D – Amendment to Bylaws, Chapter 1. Membership. Section 9, (4) Retired and Exhibit 3 proposed Constitution and Bylaws laid over from the 1999 House of Delegates.*

Report D: 2000 Budget. *Action: adopted.*

Report D: Needs Assessments Creation of a Medical School Section. *Action: adopted.*

Report D: Administrative Medicine Membership Policy. *Action: adopted.*

State Medical Society of Wisconsin

Annual Meeting Dates

March 2-4, 2001
Monona Terrace Convention Center
Madison, WI

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March 8-10, 2002
Monona Terrace Convention Center
Madison, WI

Advancing the Health of the People of Wisconsin

Awards given by SMS in 2000

Each year during the Annual Meeting, the State Medical Society of Wisconsin recognizes leaders in health care, both physicians and non-physicians, who have made significant contributions to the health and well-being of Wisconsin residents. The following awards were presented during the 2000 Annual Meeting in Milwaukee.

Presidential Citation

The SMS President awards the Presidential Citation each year to an outstanding individual who has made a significant contribution to medicine or public health. President Jack M. Lockhart, MD, presented the award to **Pauline Jackson, MD**, for her work on tobacco prevention and leadership within the medical community.

In 1993 Doctor Jackson became the first woman president of the State Medical Society of Wisconsin. During her term, she focused on tobacco prevention, specifically with children, teens and pregnant women. She was also a vocal critic of the tobacco industry's use of advertising logos on such items as hats and t-shirts. Doctor Jackson was recognized for her pioneering work as a community activist and for her efforts as a former president of the La Crosse County Medical Society and Wisconsin Psychiatry Association, as well as chief-of-staff of La Crosse-Lutheran Hospital.

Director's Award

The Director's Award is the highest honor bestowed by the State Medical Society of Wisconsin and is only granted on occasion to those who have served with outstanding distinction to the science of medicine, physicians and the residents of the state of Wisconsin.

Richard G. Roberts, MD, JD, was the recipient of the 2000 Director's Award. Doctor Roberts was recognized for his past and continuing service to the medical profession. This fall, Dr. Roberts will be sworn-in as president of the American Academy of Family Physicians (AAFP). He has served the AAFP and the SMS in many capacities including Speaker to the SMS House of Delegates (1987-1993) and as an SMS Board member for nine years. During his term as SMS president, Dr. Roberts founded the Child Safe Foundation, which distributes trigger locks and dispenses information to help prevent injuries to children. The program continues today.

Doctor Roberts is Director of Outreach and Development at the Family Medicine Department at UW Medical School, as well as medical director for the Belleville Clinic. He frequently serves as a media spokesperson for the SMS on a variety of issues including tort reform and tobacco prevention.

Distinguished Service Award

The Distinguished Service Award annually goes to someone who has furthered medical education and made a significant contribution to the science and art of medicine. The 2000 recipient is **Susan E. Skochelak, MD.**

Doctor Skochelak, a Senior Associate Dean for Academic Affairs and Associate Professor of Family Medicine at the University of Wisconsin-Madison Medical School, was recognized for her extensive work in the areas of primary care education programs. She has taught communications skills to students, residents and faculty for the past 12 years. She serves on several national education panels and collaborated in developing the STF Preceptor Education Project, the AAMC Handbook for Clerkship Directors and the Common Ground Solution's continuing education program for improving clinical communication skills. She also offers her expertise as an education consultant to more than a dozen medical schools and private foundations.

Medical Issues Reporting Award

Established in 1990, this award is presented to Wisconsin journalists who best covered health care concerns during the preceding calendar year. Criteria for evaluating candidates include quality of writing, depth of research, excellence in production, accuracy, clarity, impact in Wisconsin, fairness and originality. Reporters working for Wisconsin newspapers, magazines, radio or television stations are eligible.

Kimberly Kane, of WTMJ Television in Milwaukee, was selected as the 2000 recipient of the Medical Issues Reporting Award. She was recognized for her reporting of the data collection law, an issue few in Wisconsin were aware of before Ms. Kane's report. As a result of her story, calls to lawmakers from outraged citizens forced a compromise that assured no information that could identify patients' medical problems would

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Helping the poor see

Eye Doctor's vision becomes reality

By Steve Busalacchi, Director, News & Information

Guillermo de Venecia, MD
2000 Physician Citizen of the Year

"I loaned them half of what I have in my pension plan and I am hoping that they will pay me back," Madison's **Guillermo de Venecia, MD,** says with a laugh. There seems to be no limit to how far this 30-year member of the State Medical Society of Wisconsin will go to help people in need.

Doctor de Venecia's (pronounced dee-ven-AYE-sha) latest humanitarian triumph is to establish a free clinic in the Philippines, 100 miles north of Manila, which opened January 3, 2000. He not only personally helped finance the clinic, but spearheads efforts to staff and run it. Charitable work in the Philippines is nothing new to de Venecia, who has been performing free cataract surgery there for many years.

Operation vacation

"Since 1979, I have spent all of my vacation time in the Philippines doing surgery. I came from that country. I wanted to help the poor." Thanks to Dr. de Venecia, an ophthalmologist, 12,300 patients who were blinded by cataracts can now see.

For such tremendous dedication to serving the poor, Dr. de Venecia was named the 2000 SMS Physician Citizen of the Year. The award honors dedicated physicians for their uncompensated civic, cultural, economic and charitable services they have provided.

"He's had a tremendous impact," says SMS member Joseph Blustein, MD, of Madison. Doctor Blustein is one of the physicians de Venecia recruited to volunteer at another of his charitable projects—a free diabetes screening clinic he established at UW Madison. Doctor Blustein says his friend and colleague not only has provided a safety net for local patients who are uninsured or underinsured, he has also had a positive effect on students, residents and other physicians. "He stimulates us to do our part, too. He's amazing."

Like father, like son

Doctor de Venecia attributes his service to the poor, at home and abroad, to the influence of his father, a family practitioner who did missionary work in Africa. As a high school student, he also was impressed with the work of Dr. Albert Schweitzer, the medical missionary and Nobel Prize winner who founded a hospital for the poor in Labarene, Gabon, French Africa, in 1913. Schweitzer once said: "I am certain and have always stressed that the destination of mankind is to become more and more humane. The ideal of humanity has to be revived." Doctor de Venecia has embraced Schweitzer's philosophy and has made it his own.

"There's no question that these patients are going to die blind because they cannot afford to pay. So why don't we improve their lives?," he asks, referring to the poor in the Philippines. His reward is the reaction of patients who see after having been blind for decades.

"They're stunned. They've been talking to people and they don't know what they look like." Cataract removal also means they can read, help around the house and generally have a higher quality of life.

Build it and supplies will come

Doctor de Venecia also collects and stores donated and outdated medical equipment for the free clinic in the Philippines. So far, he has sent six packed semi trailers full of equipment that includes operating tables, beds and mattresses. Doctor de Venecia went as far as to build a warehouse on his property to store the supplies until they can be shipped out. The warehouse became necessary because he has become very good at finding equipment that is discarded in this country, but is still usable.

"My wife has been upset with me because she cannot park her car in the garage," the doctor recalls.

But his wife Marta, a surgical nurse, is clearly supportive of the effort. She coordinates the recycling of supplies and sterilizes the equipment, in addition to screening patients for surgery. Screening good candidates for surgery was also the primary responsibility of SMS member Frank Myers, MD, who has made the trip to the Philip-

pines several times with Dr. de Venecia, a colleague of 35 years. Although Dr. Myers was essential in determining which patients could still be helped, he says Dr. de Venecia has the uncanny ability to tell who the most needy patients are. That's important, because some people try to slip in for free care when they hear American doctors have arrived.

"But Guil could always tell because of their clothes or how they talked or what they looked like or something, that nah, this is somebody who can afford the surgery," said Myers, who also serves as Vice Chairman of the free clinic's Board of Directors. Doctor de Venecia strives to help the poorest patients without hurting the practices of local eye doctors who struggle to make a living themselves.

Running hot

Although retired at age 68, Dr. de Venecia spends much of his time preparing for another mission to the Philippines, which he typically embarks on in winter.

In his free time there, he enjoys jogging along the beach, eating fresh lobster from the sea and tending his garden. The doctor also continues to visit old friends and family, including his 93-year-old mother. "It's like going back to your childhood," he muses.

Of course, it's his zeal to help the blind see that brings Dr. de Venecia back to his native land—something he hopes to continue doing for the foreseeable future.

"I have the same philosophy as when I was young—to help the poor."

Editor's note: To contribute to Dr. de Venecia's Clinic, send donations to: Free Rural Eye Clinics Corporation, P.O. Box 5242, Madison, WI 53705.

2000 Awards

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be sent to the state or released to employers.

Ms. Kane was also commended for her reports on the dangers of smoking, the problem of antibiotic resistance and proposals to increase patient rights with regard to insurance coverage.

Health Leadership Award

The SMS presents this award to a person or persons who have made significant contributions to the development of health care policies that benefit the people of Wisconsin and advance the science of art and medicine. **State Representative Scott Walker** (R-Wauwatosa) was the 2000 recipient of the Health Leadership Award.

Representative Walker was recognized for his tremendous efforts to protect patient privacy. He took the lead in authoring important patient consent legislation that forced a compromise on data collection in the legislature. He also worked to secure significant dollars for tobacco prevention activities from the tobacco settlement money.

Certificate of Appreciation

An SMS Certificate of Appreciation was presented to **Charlie Sykes**, the provacative host of a top-rated program on Milwaukee's WTMJ Radio, as well as host of *Sunday Insight* on Today's TMJ4 Television. Mr. Sykes was recognized for educating the public about medical confidentiality. Shortly after Wisconsin's data collection was signed into law, Mr. Sykes' persuasive, reasonable arguments helped fuel many calls to legislators' offices, turning this issue on its head. His passion for medical privacy helped forge a compromise on the issue preventing patients' private medical information from going to the state of Wisconsin.

Erwin R. Schmidt Interstate Teaching Award

Dennis Maki, MD, the Ovid O. Meyer Professor of Medicine at the University of Wisconsin-Madison, is the 2000 Erwin R. Schmidt Interstate Teaching Award recipient. A distinguished teacher and researcher, Dr. Maki is well-known for his research on the causes and prevention of hospital–acquired infections. He is head of the section of infectious diseases at UW and former president of the Society of Healthcare Epidemiologists of America and Councillor for the Infectious Diseases Society of America.

Meritorious Service Awards

Each year during the Annual Meeting, the SMS recognizes leaders in health care who have made significant contributions to the medical profession, and who have given extraordinary service to the SMS, primarily through their tenure on a commission or committee. The following individuals earned 1999 Meritorious Service Awards:

Bruce B. Berry, MD, of Milwaukee, for eight years of service on the Council on Mediation and Peer Review (formerly the Commission on

Mediation and Peer Review), including two years as chair.

Maury B. Berger, MD, of Milwaukee, for four years of service on the Council on Health of the Public (formerly the Commission on Geriatric Health), including three years as vice chair.

Gregory B. Buck, MD, of Wauwatosa, for 10 years of service on the Council on Governmental Affairs (formerly the Governmental Affairs Commission).

Gerald A. Bucholtz, MD, of Marshfield, for four years of service on the Council on Health of the Public (formerly the Commission on Environmental & Occupational Health).

Clarence P. Chou, MD, of Mequon, for eight years of service on the Council on Health of the Public (formerly the Commission on Public Information).

Clyde M. Chumbley, II, MD, of Menomonee Falls, for nine years of service on the Council on Health Care Access and Financing (formerly the Commission on Health Care Financing and Delivery).

Mark Andrew, MD, (right) congratulates Richard Roberts, MD, JD, on receiving the Directors Award during the SMS Inaugural Ceremony. Doctor Roberts received the award for myriad activities including membership on the SMS Board, House of Delegates Speaker, starting the Child Safe Foundation and being sworn-in as president-elect of the American Academy of Family Physicians.

Douglas M. DeLong, MD, of Ladysmith, for four years of service on the Board of Directors.

Philip J. Dougherty, MD, of Menomonee Falls, for nine years of service on the Council on Ethics and Judicial Affairs (formerly the Commission on Medicine and Ethics).

Thomas C. Gabert, MD, of Woodruff, for six years of service on the Council on Medical Education (formerly the Commission on Medical Education).

John E. Inman, MD, of Monroe, for nine years of service on the Council on Health of the Public (formerly the Commission on Maternal and Child Health), including two years as chair.

Richard S. Kane, MD, of Milwaukee, for 10 years of service on the Council on Health of the Public (formerly the Commission on Geriatric Health), including five years as chair and four years as vice chair.

Edward G. Kass, MD, of Waukesha, for five years of service on the Council on Health of the Public (formerly the Commission on Public Information).

John J. Kelly, MD, of Milwaukee, for six years of service on the Council on Health Care Access and Financing (formerly the Commission on Medical Liability and Risk Management), including two years as vice chair.

Randall J. Kieser, MD, Verona, for seven years of service on the Council on Health of the Public (formerly the Commission on Addictive Diseases), including four years as vice chair.

Jeffrey H. Lamont, MD, of Wausau, for five years of service on the Council on Health of the Public (formerly the Commission on Maternal and Child Health).

Brian E. Lochen, MD, of Madison, for nine years of service on the Council on Health of the Public (formerly the Commission on Addictive Diseases), including two years as vice chair.

Mark C. Moore, MD, of Madison, for five years of service on the Council on Health of the Public (formerly the Commission on Environmental & Occupational Health), including one year as chair.

Timothy J. O'Neil, MD, Columbus, for eight years of service on the Council on Health of the Public (formerly the Commission on Maternal and Child Health), including three years as chair.

John J. Ouellette, MD, of Madison, for nine years of service on the Council on Health of the Public (formerly the Commission on Environmental and Occupational Health).

Patrick L. Remington, MD, of Madison, for seven years of service on the Council on Governmental Affairs (formerly the Governmental Affairs Commission).

David A. Satchell, MD, of Manitowoc, for 10 years of service on the Council on Mediation and Peer Review (formerly the Commission on Mediation and Peer Review), including two years as chair and two years as vice chair.

George R. Schneider, MD, of West Allis, for 11 years of service on the Board of Directors.

Norman J. Schroeder, II, MD, of Green Bay, for 10 years of service on the Council on Health Care Access and Financing (formerly the Commission on Health Care Financing and Delivery).

Sidney Shindell, MD, of Milwaukee, for six years of service on the Council on Health Care Access and Financing (formerly the Commission on Health Care Financing and Delivery).

Gregory A. Shove, MD, of Racine, for five years of service on the Council on Health Care Access and Financing (formerly the Commission on Health Care Financing and Delivery).

Elizabeth Tucker-Sanfelippo, MD, Fond du Lac, for 10 years of service on the Council on Medical Education (formerly the Commission on Medical Education).

Frank H. Urban, MD, of Brookfield, for six years of service on the Council on Health Care Access and Financing (formerly the Commission on Health Care Financing and Delivery).

Abraham Varghese, MD, of Milwaukee, for five years of service on the Council on Health Care Access and Financing (formerly the Commission on Medical Liability and Risk Management).

Michael A. Weiner, MD, of Madison, for five years of service on the Council on Health Care Access and Financing (formerly the Commission on Medical Liability and Risk Management).

William G. Weber, MD, of Oshkosh, for nine years of service on the Council on Ethics and Judicial Affairs (formerly the Commission on Medicine and Ethics).

Leonard W. Worman, MD, Milwaukee, for six years of service on the Council on Health of the Public (formerly the Commission on Addictive Diseases). *Posthumously presented to family.*

Physician Citizen of the Year Award

Implemented in 1982 as a colleague-nominated award, the Physician Citizen of the Year Award's annual nomination process was opened to the public in 1991. Each year since then, based on these nominations, the State Medical Society of Wisconsin selects award recipients.

The Physician Citizen of the Year Award honors recipients for the uncompensated civic, cultural, economic and charitable services they have provided to their local or state communities, recognizing those who have given their time and talents. The 1999 recipient of this distinguished award is **Guillermo de Venecia, MD.**

Doctor de Venecia, of Madison, has been dedicated to serving the health needs of the poor for more than two decades. He established a free eye clinic in the Philippines that has helped 11,500 poor people regain their eyesight. With his own money, Dr. de Venecia also built a 1,000 square-foot warehouse next to his house to store donated supplies for the clinic. *(See article on page 70.)*

Amy Hunter-Wilson, MD, Scholarship Awards

This award is presented to American Indians to pursue training or advanced education as physicians, nurses or technicians, or in related health fields. Award amounts are based on the student's admission field of study. The following students were 2000 winners: **Julie Behnke, Sandyra Bhalla, Brenda Cary, Vera Heubel,** Amy **Kivisto, Adam Pocan** and **Sidney White.**

The John H. Houghton and William J. Houghton Award

This $500 award is presented annually to senior medical students who have shown outstanding scholastic and leadership abilities. The honor is granted to one student at each of Wisconsin's two medical schools. The winners for 2000 are **Joshua Modder**, from the University of Wisconsin, and **James R. Robinson, III**, from the Medical College of Wisconsin.

County Medical Society Officers

Key: President (P), Immediate Past President (IPP), President Elect (PE) Vice President (VP), Secretary (S), Treasurer (T), Secretary/Treasurer (ST), Executive Secretary (ES), Executive Vice President (EVP), Executive Director (ED). As of 7/21/00.

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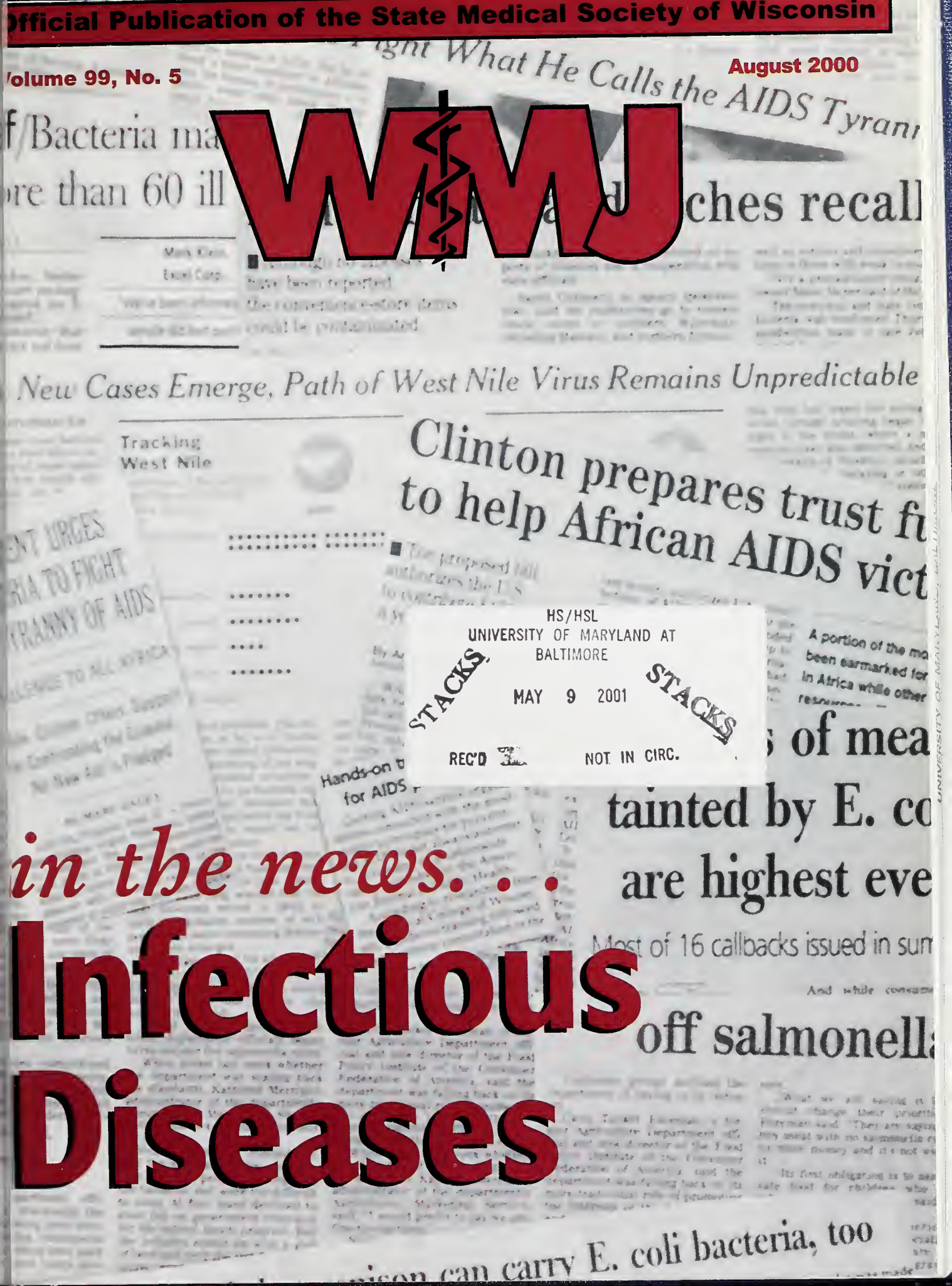

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Editorial

Public Health Series Take 3: Infectious Disease

by Thomas C. Meyer, MD, WMJ *Medical Editor*

The third issue in this year's follow-up review of *Healthier People in Wisconsin - 2000* deals with infectious diseases and the role of the Division of Public Health in surveillance, applied research, prevention and control of communicable diseases in Wisconsin.

Doctor Davis introduces us to the current initiatives of the Division (p 12) of emerging and re-emerging infections, antibiotic resistance, infectious agents as the causes of chronic diseases and the potential for bioterrorism. Within his report, he draws attention to the new syndromes identified in the last ten years, current requirements for reportable diseases and he provides compelling evidence of the success of the various vaccines in the prevention of infectious diseases. Doctor Enders and his colleagues expand on this in relation to Hib vaccine and H. influenza meningitis (p 45).

John Chapin, Administrator of the Wisconsin Division of Public Health, continues guest editorials with a discussion of the "Healthy People 2000" document. He explains that while the document seems very official, it was never adopted by either the state's executive branch or the legislature. Hence, support from the public health and physician communities is vital for the success of the 2010 public health plan.

The articles in the scientific section of the journal expand on Dr. Davis' overview. Doctors Proctor and Davis provide details of the behavior of *E. coli* 0157:H7 in eight outbreaks of disease in the state in recent years, the age groups of people at greatest risk and the seasonality of the outbreaks as well as the risk factor/exposure which was reported by the relatively small number of affected individuals responding to the enquiries (p 32). Buried in the report are several interesting "tidbits" e.g. that children may continue to shed *E. coli* 0157:H7 for as long as 3 weeks after becoming asymptomatic. The authors' list of good advice for the prevention of outbreaks is worthy of review.

In the report of HIV infection in Wisconsin (p 38) Mr. Hoxie et al. provide data showing the progressive decreases in the number of new cases reported and the number of deaths and the resulting overall increase in the number of persons with HIV infections who are alive. Doctor Vergeront and his colleagues provide an exhaustive review of the state and national resources for patients afflicted with HIV and clinicians caring for them (p 49). It's surely a "tear out" reference for use when confronted by patients and families dealing with the disease if one is to give valid counsel.

The report of the July 1999 heat wave in Wisconsin submitted by Ms. Rajpal et al. (p 41) may not be as pertinent during this more temperate summer, but nevertheless provides warning of the patients who are at greatest risk when the next heat wave strikes. I am drawn to the type of side bar (some call it an "idiot-list!") of the signs and symptoms of heat-related illnesses and what to do under each set of circumstances.

Finally we are pleased to include the proceedings of the annual meeting of the Wisconsin Chapter of ACP/ASIM (p 60). The reports of exotic and sometimes unpronounceable diseases in the case reports are a source of great interest as are some recent innovations reported by the residents. The "oh wow" tone of the reports of such old adversaries and TB and syphilis made this observer feel his age!

"Reason can answer questions, but imagination has to ask them."

— Ralph Gerard

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Letter to the Editor

Too Many Treatments for Parkinson's Disease: How Should They Be Used?

Doctor Reynolds and his colleagues have provided an overview of current therapy of Parkinson's Disease and reviewed medical as well as surgical options (*WMJ* 2000; 99:57-61). As noted in the context of their article, considerable controversy exists regarding optimal therapy of this patient population. As director of one of the largest treatment centers for Parkinson's Disease in North America, I have concerns over some of the observations made by Dr. Reynolds and the treatment suggestions offered in his article. I fully understand that some of the issues in this article have no data to support or refute them, and I have specifically avoided debating the issue of what, if any, surgical treatment may be beneficial in this patient population. Some of the suggestions made in this article, however, are clearly dangerous and require further discussion. Since the *Wisconsin Medical Journal* is read by physicians without specific training in neurology and neuropharmacology I feel a responsibility to clarify these issues.

Psychosis, or visual hallucinosis is a recognized side effect of anti-Parkinson medications. In their article Dr. Reynolds suggests that treatment options include risperidone, olanzapine or haloperidol. I would caution physicians that the use of these specific medications is fraught with risk and may be associated with a dramatic exacerbation of Parkinsonian symptoms which may be life threatening. Our center provides cards for patients with Parkinson's Disease which they are to present any time they seek medical treatment. These cards list medications which are medically contraindicated in their care, by virtue of their ability to induce Parkinsonian symptoms. In our most recent version of this card, we list haloperidol and olanzapine as contraindicated drugs. This is based on ample clinical experience and experimental data showing that both of these agents are potent D-2 dopamine receptor antagonists, that block the motoric effects of dopamine centrally. This effect is extremely long in duration and may create problems with swallowing and ambulation that can be catastrophic. Risperidol has also been recently shown to have significant D-2 blocking activity, but its main limitation in Parkinson patients is its potent sedative effect which precludes the use of doses above 1 mg per day, far below its usual antipsychotic range. We regard these suggestions for treatment as potentially lethal and suggest that physicians avoid these drugs in treating Parkinsonian patients. From a medico-legal standpoint, the use of these agents may, and has been considered, medical malpractice. Having had the opportunity to act as an expert medical witness in such cases, I can assure your readership that such cases have uniformly been settled in favor of the plaintiff. Clearly, these agents constitute a major problem in Parkinsonians and physicians should consider quetiapine or clozapine as the only safe treatment modalities available.

From a clinician's standpoint, we have found the newer synthetic dopamine agonists very useful in the treatment of advanced Parkinson's Disease. While many patients were on 6-8 doses of levodopa a few years ago, with erratic control in spite of stringent dosage adjustment, most of these patients are now on Q.I.D. drug regimens with much more predictable response. Our success with these agents has been so successful that we rarely have suggested surgical alternatives to any of our patients. While Dr. Reynolds and colleagues report remarkable success in treating tremor, this has not been our own experience nor that reported in the literature. Success rates are usually stated to be in the range of 60%.

It should also be stated that surgical morbidity is a real concern. The risk of intraoperative cerebral hemorrhage needs to be weighed against therapeutic benefits. In pallidotomy patients we have been impressed by the prevalence of significant neurobehavioral changes in patients with bilateral procedures. These patients look very much like they have received frontal lobotomy. There are obviously tracts which subserve non-motoric functions and may become involved in the lesions, and we view these surgical outcomes as far from satisfactory. It has been our feeling that surgical treatment for Parkinson's Disease is a therapy which is only appropriate for patients in whom all medical measures have failed. With meticulous medical treatment, this appears to be an option which only a very small patient population may require.

Incidentally, the article says Carbidopa, also known as Lodosyn, is available on a complimentary basis from the manufacturer, identified as Abbott Laboratory. In fact, Lodosyn is available only by prescription and is produced by DuPont. The cost of Lodosyn is now approximately six times that of the generic Sinemet, limiting its usefulness.

Paul A. Nausieda, MD, Director, National Parkinson Disease Center of Excellence, Sinai-Samaritan Medical Center Milwaukee, Wisconsin

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The individuals listed below were recently elected to SMS membership by their County Medical Societies. We are pleased to welcome them to the SMS.

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Jack S. Havdala, MD
William H. Richards, III, MD

Dane
Gail S. Allen, MD
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Marta M. Bogdanowicz, MD
Mary E. Bussey, MD
Martha A. Cabeen, MD
Neil P. Connor, MD
Barry C. Fox, MD
Kathryn M. Jenkins (S)
Bassel Kazkaz, MD
Jane E. Kiff, MD
Anthony Panos, MD
Frances L. Pogue, MD
Jose R. Ponte Jr., MD
Dorothy A. Ritter, MD
Karl F. Szewczyk, MD
Marie Ritthamel Weinstein, MD
Karen Schildknecht Wiringa, MD
John K. Wollaeger, MD

Grant
Ann E. Evensen, MD

Jefferson
Eric A. Andersen, MD
Barry P. Cash, MD
James C. Flood, MD
Jeffrey A. Meade, MD
Kristi A. Sharkus, MD

La Crosse
Lynn Keene, MD
David W. Metzler, MD, MS

Langlade
Susan Z. Nordin, MD

Manitowoc
Geri A. Carducci, DO
Grazyna Grace Czerwonka, MD
Margaret L. Klatt, MD
Richard S. Stein, MD

Milwaukee
Jeffrey M. Adler, MD
Darin Allred (S)
Kristin M. Anderson (S)
Jill Bader (S)
Kenneth S. Bark (S)
James F. Bencivenga (S)
Leah Bevers (S)
Brian Blonigen (S)
Sarah Ann Botsford (S)
Nathaniel Buffington (S)
Bruce H. Campbell, MD
Patricia B. Carpenter, MD
Malin Chaipat (S)
Lucia Scu-En Cheng (S)
Kevin Cummisford (S)
Sunavo Dasgupta (S)
Timothy J. Ebbert (S)
Alexandra Farley (S)
Edmund J. Fernandez, MD
Gary L. Fillmore (S)
Valerie A. Flanary, MD
Chelsea M. Foster (S)
Barbara L. Hale (S)
Ramon Gaylon Halum III, MD
Scott Hansen (S)
Thomas N. Hansen (S)
Suzanne Walczak Hare (S)
Luke K. Hermann, MD
Francis N. Herrbold, MD
Carrie E. Hink (S)
Jennifer E. Iacovelli (S)
Jason A. Jarzembowski, MD
Shana Johnson (S)
Jennifer M. Johnson-Patel (S)
Kevin Kao (S)
Brian P. Keefer (S)
Jennifer Knight (S)
Amit Kulkarni (S)
Nathan M. Larsen (S)
Katie J. Lasota (S)
Dennis J. Laundrie, MD
David A. Lewis, MD
Douglas M. Long, MD
Candice Lovell (S)
Larissa Malmstadt (S)
Jenny Martin-McKay (S)
Amitoj Marwaha (S)
Jennifer K. May, MD
John N. Melander (S)
David Milia (S)
Stephen Miller (S)
Van T. Nguyen (S)
Adam D. Niesen (S)
Andrew J. Norton, MD
Randa Kamel Noseir, MD
Sakkapol Ongwijitwat (S)
Nileshkumar Patel, MD
Vu Phan (S)
Michael R. Pharaon (S)
John Phillips (S)
Ellen Piernot (S)
Susan Pitt (S)
Matthew R. Poulsen (S)
Scott M. Reabe (S)
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Robert L. Schwartz, MD
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Joanne Sun (S)
Mark Sytsma (S)
Norman Taylor (S)
Michael Telisak (S)
Melissa Themar (S)
Kay Ellen Theyerl (S)
Charles W. Todd (S)
Ellen Cass Turner (S)
Chad Vaskuil (S)
Sabrina Wagner (S)
Jason Weindorfer (S)
Matthew Welsch (S)
Alison Wierzbicki (S)
Douglas C. Wonder, DO
Jason T. Wray-Raabolle, MD
Catherine T. Yoo, MD
Allison Ziff (S)
Rebecca A. Z. Zurawski (S)

Ozaukee
Therese Bullis, MD
Timothy Jahn, MD
Daniel Joyce, MD, FACEP
Jamie Lynn Kondelis, MD
Audra M. Thomas, MD
Bruce E. Weffenstette, MD

Pierce-St. Croix
Eric A. Poulin, MD

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AMA Awards

The SMS member physicians listed below recently earned the AMA's Physician Recognition Award. They have distinguished themselves and their profession by their commitment to continuing education, and the SMS offers them its congratulations.

Shannon P. Allen-Gryzwa, MD
Carlos A. Alvarado-Valdes, MD
Margaret B. Amateau, MD
Yolanda Tai Becker, MD
Paul F. Bostrom, MD
David F. Brown, MD
Shari Lyn Burns, MD
Marcin A. Chwistek, MD
Ronald D. Davis, MD
William S. Dougherty, MD
Douglas R. Fownes, MD
Lucy Guerra, MD
Aneesh Madanlal Gupta, MD
Joseph K. Han, MD
Michael H. Hoffman, MD
Lloyd D. Hughes, MD
Fahim Ud Din Kazi, MD
Stephen J. Marquis, MD
Peter B. Martens, MD
Catherine C. Martin, MD
Douglas E. Marx, DO
John Wm. McDonough, DO
Michael L. Murphy, MD
Ned R. Novsam, MD
Francisca Olmedo-Estrada, MD
Vernon S. Partello, MD
Theodore A. Praxel, MD
Enas L. Pruitt, MD
Mark S. Remshak, MD
David M. Saarinen, MD
John F. Seccombe, MD
Jaswinder Kaur Sidhu, MD
James R. Starling, MD
Russell S. Sudbury, MD
Uma Thirumakizhma, MD
Jessica L. Thomason, MD
Scott W. Thompson, MD
Kristen L. Thomsen, MD
Paul T. Wadina, MD
Susan S. Wang, MD
John D. Watson, MD
Stephen B. Webster, MD
Benjamin C. Wedro, MD
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Richard L. Wolman, MD
Xiaogang Zhang, MD
Joseph G. Zondlo, MD
Teresa Zyglewska, MD

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Who's in the News

The University of Wisconsin Medical Alumni Association recently presented **James Albrecht, MD,** with its Ralph Hawley Distinguished Service Award for his role in establishing and maintaining Donated Health Care.

Constante S. Avecilla, MD, was awarded the Gail H. Williams Teaching Award and **John W. Melski, MD,** received the Dermatology Teaching Award during the graduation ceremony of the Residents Program under the direction of Marshfield Clinic and Saint Joseph's Hospital, Marshfield. Graduating residents voted for the physician they thought was the best teacher during their residency.

Donald Burandt, MD, of Beloit, has been named Pediatrician of the Year by the Wisconsin Chapter of the American Academy of Pediatrics.

Retired Hartland physician **Richard Chambers, MD,** received the 2000 Distinguished Service Award from the Wisconsin Association of Homes and Services for the Aging in May.

Douglas Clark, MD, and **Phillip Dougherty, MD,** have been named recipients of the first Spirit of Caring Awards presented by Community Memorial Hospital. Clark was named the Spirit of Caring Award – Health Innovation recipient and Dougherty was named the Spirit of Caring Award – Community Services recipient.

Prairie du Sac surgeon **Tony DeGiovanni, MD,** was part of a 13-member medical team that traveled to Thiotte, Haiti, where they performed surgery, dispensed drugs and taught the residents about public health and disease prevention.

Reappointed to the state Medical Examining Board by Gov. Tommy Thompson are **Sidney Johnson, MD,** a retired physician from Marshfield Clinic and **Bhupinder Saini, MD,** medical director of St. Luke's South Shore in Cudahy.

Todd Mahr, MD, a pediatric allergist and asthma specialist at Gundersen Lutheran Medical Center, developed a national program entitled "Exercise and Asthma" to teach those in physical education and sports how to help children participate fully and safely in physical activities. His program was adopted by the American Lung Association and has helped earn him the association's national award for volunteer excellence for program innovation.

Patricia Raftery, MD, was named the National Rural Healthcare Provider of the Year by the National Rural Health Association. She is a family practice physician for Franciscan Skemp Healthcare in Sparta.

Tuenis Zondag, MD, co-chair of the Department of Health Works at the Mayo Health System in Eau Claire, became a Fellow of the American College of Occupational and Environmental Medicine for providing leadership to promote optimal health and safety of workers, workplaces and the environment.

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In Remembrance

Damiano, Nicholas F., MD, 72, of Surprise, AZ, formerly of Greendale, passed away June 3, 2000. He earned his medical degree from Marquette University and completed his internship at St. Mary's Hospital in Milwaukee. Doctor Damiano served in the US Navy for two years. For over 30 years, he was on the staff of St. Francis, St. Luke's and West Allis Memorial Hospitals and had his family practice in Hales Corners. He was a charter member of the Wisconsin Academy of Family Practice.

Doctor Damiano is survived by his wife Dorothy; his children, Michael (DelRey), Patrick (Cynthia), Barbara (Michael) Kowalski; his grandchildren, Christian (Stacey), Evan, Skylar, Peter and Nicole Damiano; Jacob, Troy and Brandon Kowalski.

Giffin, Walter S., MD, 85, of Appleton, passed away May 5, 2000. After earning his medical degree from Marquette University School of Medicine in Milwaukee and completing his internship at St. Elizabeth Hospital in Appleton, he established a practice in Appleton. Doctor Giffin served in the Air Force as a captain in the Medical Corps for four years. He returned to Appleton and, in 1954, founded the Medical Arts Clinic Inc., which later became LaSalle Clinic.

Doctor Giffin served as chief of staff of St. Elizabeth Hospital, was a member of the 1988 SMS Fifty Year Club and was instrumental in the creation of the Community Blood Bank in the Fox Valley area.

Doctor Giffin is survived by his wife, Helen; his children, Barbara (Frank) Hawkins, of Bluffton, SC, Patt (Dave) Birling, of Oshkosh, Mike (Vonnie) of Appleton, Peter, of St. Paul, MN; 11 grandchildren, and seven great-grandchildren.

Hopkins, Charles E., MD, 82, of Eastham, MA, formerly of Madison, passed away July 15, 2000. He earned his medical degree from Syracuse Medical School, Syracuse, NY, completed his pediatric residency at Massachusetts General Hospital and his internship at Chelsea Naval Hospital. He practiced pediatrics at the Dean Clinic from 1950 to 1988. During this time, he also taught pediatrics at the University of Wisconsin Medical School and was presented the Outstanding Professor Award.

Doctor Hopkins was the first Wisconsin physician to volunteer to serve with a US Agency for International Development team in Vietnam in 1966, and in 1983 he opened a center for childhood learning disabilities in Madison. He was a member of the 1995 SMS 50 Year Club.

Doctor Hopkins is survived by his daughters, Patty Barnes, of Dennis, MA, Jeamie Holm, of Madison, Susan Canu, of Easthan, MA, Sally Mulhern, of Portsmouth, NH; eight grandchildren and two great grandchildren.

Lewinnek, Walter, MD, 88, of Merrill, passed away July 3, 2000. He earned his medical degree from Northwestern Medical School in Chicago, IL, and prior to World War II practiced in Mason City, IL. He enlisted in the Army Air Force and served as a flight surgeon.

After World War II, Dr. Lewinnek moved to Merrill and practiced family medicine until his retirement in 1990. He served as Medical Director at Pine Crest Nursing Home, Merrill, and as president of the Lincoln Unit and Wisconsin Division of the American Cancer Society. He was honored as the SMS Physician Citizen of the Year in 1983, was a member of the 1987 SMS Fifty Year Club, and in June 1993 he was honored for his extended service and great contribution to the City of Merrill.

Doctor Lewinnek is survived by his wife, Beryl; his children, Susan (Robin) Murray, Melrose, MA, George, Leominster, MA; and his grandchildren, Sarah Murray and Karen, Elaine and David Lewinnek.

Lukasek, Edward O., MD, 78, of Sparta, passed away May 28, 2000. He earned his medical degree from the University of Chicago and completed his internship and residency at St. Francis Hospital, Evanston, IL.

Doctor Lukasek obtained the rank of captain in the US Army Medical Corps and was stationed in the South Pacific from 1948 to 1950. He was in solo practice in Sparta from 1950 to 1973. From 1973 to his death, he was on staff at the Tomah Veterans Administration Medical Center.

Doctor Lukasek's professional activities were numerous and include serving 11 years on the SMS Committee on Addictive Diseases and nine years on the SMS Committee on Geriatric Health. He was a member of the 1996 SMS Fifty Year Club, recipient of the American Medical Association Physicians Recognition Award from 1974 to 1984, served as an intervenor with the Statewide Impaired Physician Program, Fellow of the American Association of Family Practitioners, and was a member of the Department of Health and Social Services Community Support Task Force.

Doctor Lukasek is survived by his children, Kathryn E. Lukasek Bauer (Robert Lyman Jr., fiance) of La Crosse, Charles (Marilyn), Edward (Marsha Ann), Peter (Denise), Frederick (Ann), all of Sparta; and his grandchildren Timothy, Matthew, Carolyn, Mary, Joanna, Michael, Emily, Andrew, Meredith, Jennifer, Sara, Jason, Frederick and Victor.

McAweeney, William J., MD, 66, of Madison, passed away June 1, 2000. Doctor McAweeney received his medical degree from George Washington University School of Medicine, Washington, DC, and completed his residency in internal medicine at St. Vincent Hospital, Worcester, MA.

Doctor McAweeney served as a captain for two years with the US Army. He began his practice in July, 1963 at Jackson Clinic/ Physicians Plus, where he practiced for 35 years. He was past president of the medical staff at Jackson Clinic and was a member of the Academy of Internal Medicine.

Doctor McAweeney is survived by his children, Theresa (Everett) of Boston, MA, William of Dexter, MI, Peter (Tod) of San Francisco, CA, Kathleen (Andy) of Evansville, Michael (Karen) of Columbia, MD, Mary (Pat) of Perkasie, PA, and Tara (Kirtt) of Madison; five grandchildren, Colin, Lauren, Ryan, Erin and Kevin.

Prier, Thomas A., MD, 73, of Brookfield, passed away June 29, 2000. He earned his medical degree from Marquette University, completed his internship at St. Mary's Hospital in Milwaukee, pediatric residency at Children's Hospital of Wisconsin and neonatal-perinatal residency at Charity Hospital in New Orleans. He served in the US Air Force and was a veteran of World War II. Doctor Prier was a pediatrician in private practice for over 40 years. He served as Chairman of the Department of Pediatrics at St. Joseph's Hospital for over 20 years and was instrumental in the formation of the Neonatology Department at St. Joseph's.

Doctor Prier is survived by his daughters, Mary (Art) Stout and Lisa (Greg) Wallace, and grandchildren, Catherine, Monica, Maria, David, Daniel and Clare.

Savage, George W., MD, 73, of Marathon, FL, formerly of Appleton, passed away February 24, 2000. He served with the US Navy for two years and during that time was involved in the atomic blast tests in 1946 at Bikini Atoll.

Doctor Savage earned his medical degree from the University of Wisconsin Medical School and completed his internship and residency at Lutheran Hospital in Milwaukee. In 1956 he established his practice in obstetrics and gynecology in Appleton and was a founder of Obstetrical and Gynecological Associates of Appleton. He was on the medical staff at both Appleton Medical Center and St. Elizabeth Hospital, was a member of the Milwaukee Gynecological Society, and the Outagamie County Medical Society.

Doctor Savage is survived by his wife, Grace; his children, Dr. Stephen (Lorrie) of Appleton; AnneMarie (Jeffrey) Ellison, of Monkton, VT; Dr. Ellen Savage, of Berlin, WI; Robin (John) Sedivy, of Roanoke, VA; Alison Nigl, David Brahe, Bruce (Judy) Brahe, all of Appleton; and 18 grandchildren.

Zhu, Ning, MD, 39, of Brookfield, passed away June 21, 2000. He earned his medical degree from Kiangsu College of New Medicine in Nanking, PR China. He was most recently a resident at the Medical College of Wisconsin Affiliated Hospitals in Milwaukee and was a member of the Milwaukee County Medical Society and the State Medical Society of Wisconsin.

Doctor Zhu is survived by his wife, Yongilan Zhu Wang, and his children, Margaret Yue and Diana Xuan.

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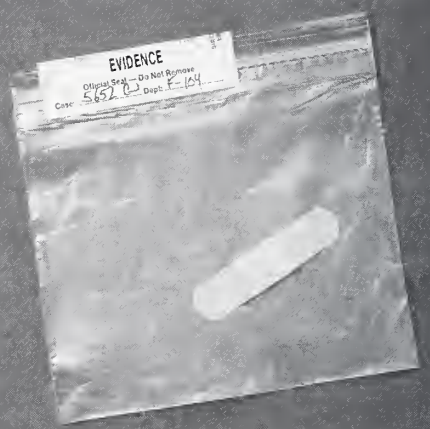

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Guest Editorial

What is Healthy about the "Healthy People 2000" Document?

by John Chapin, Administrator, Division of Public Health

Many of the articles in the *WMJ* issues on public health focus on objectives from the Year 2000 document developed in 1989. The fate of the "State Health Plan" for the 1990s is instructive for the development of the 2010 state goals. As Administrator of the Division of Public Health (DPH) within the Department of Health and Family Services (DHFS), my standard speech to the public health community is that the "Healthy People 2000" document (1989) that defined public health goals and objectives for the last decade was not of much service to public health in Wisconsin.

That document appears on the surface to be very official. The cover insert presents the following history: a legislative committee requests a long-range plan from the department, the department secretary appoints a committee and yet another secretary appoints two more committees, over 150 individuals participate in its development, and the Division of Health (DOH) employees staff the process with two managers as co-directors. The plan is published by the Division of Health and "accepted" by the Governor.

However, a closer inspection reveals it is not typified as a department document and the four credited committee chairs are all outside of state service. It is presented as the independent product of 150 individuals, published by DOH on behalf of the public health community and not as a Department treatise. The saddest fact about the year 2000 document is that it was never adopted by either the executive branch (the department and the governor) or by the legislature. Its objectives were never proposed in any biennial budget. It was never funded by the legislature in any legislative package, and its outcomes were never made into administrative rule. None of its goals or objectives became law. The Department never included it in any strategic business plan. The political fact is that "Healthy People 2000" was "dead on arrival" as a public policy document. As a "State Plan" it had and has no power behind it.

The political fact is that "Healthy People 2000" was "dead on arrival" as a public policy document. As a "State Plan" it had and has no power behind it.

After a decade there is also no fiscal reflection of that document, nor is there any programmatic reflection. The public health dollars from the state over the decade are not targeted to any specific 2000 goals, but are categorical funds passed by the legislature for particular programs – not year 2000 outcomes. Therefore, no one politically bought into this plan. It was never codified or funded.

In the revised public health statutes of 1993 (Wisconsin is one of few states with modern revised public health laws), section 250.07 directs the department to develop every 10 years a successor document to healthier people in Wisconsin and to use that document "to use the resources of the state to meet the health needs of residents...to implement the objectives that relate to state government in statutes or in public health rules promulgated by the department." Nothing, however, in terms of services or functions are mandated and no resources are allocated with that directive.

That is the challenge faced by all of public health in developing a plan for 2010. That plan will not be implemented and institutionalized as a true "State Health Plan" until it is part of the joint political agenda of both the public health and physician community. Without the active support of the public health community, the physician community and powerful organizations such as the State Medical Society, it will become just another volume of fiction. That is what has to be avoided if we are to achieve the goals of 2010.

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Infectious Diseases in Wisconsin

A Public Health Perspective

by Jeffrey P. Davis, MD

Introduction

The considerable efforts to control communicable diseases have historically formed the basis from which a broad range of public health activities have evolved. Indeed, these efforts encompass three (vaccination, control of infectious diseases, and safer and healthier foods) of 10 great public health achievements in the United States during the 20th century.[1] Recent concerns and increasing awareness related to emerging infections, antibiotic resistance, infectious agents as causes of chronic diseases, and the potential for bioterrorism events provide frequent reminders of the intricate and challenging presence of infectious diseases despite the monumental benefits provided by advances in sanitation and availability of vaccines and antimicrobial agents. The dynamic nature of infectious diseases, the potential posed by new technologies and the need to maximize available resources have fostered expansion of traditional and emergence of nontraditional partnerships to meet the challenges posed by infectious diseases.

Healthier People in Wisconsin: A Public Health Agenda for the Year 2000 [2] provided a framework for all with an interest in health to understand and reduce the most important health risks in the state and thereby facilitate improvement in our health status. Public health and health care professionals in Wisconsin have been mindful of this agenda and have used it in structuring programs to improve or develop services to prevent and control communicable diseases and accommodate change inherent in these activities. Following is a discussion of some recent activities and emerging challenges presented by major public health communicable disease programmatic category.

Emerging and Re-emerging Infections

Disease-causing microorganisms have threatened human health since the dawn of time. Following publication of the 1992 Institute of Medicine report *Emerging Infections: Microbial Threats to Health in the United States*, there has been increasing awareness that this threat will continue and may intensify in future years.[3,4] The very nature of emerging and re-emerging infectious diseases makes it virtually impossible to predict the specific agents or the time or place of their appearance. In response to the challenges posed by these diseases, in 1998 the Centers for Disease Control and Prevention (CDC) embarked on the second phase of the effort initiated in 1994 to develop and implement a strategy to combat emerging infectious disease threats.[5] The objectives of this strategy are organized under four goals of surveillance and response, applied research, infrastructure, and prevention and control, and target nine categories of problems that cause substantial human suffering and societal burden. The Wisconsin Division of Public Health (WDPH) within the Department of Health and Family Services is working closely with our public health partners as an active participant in addressing the objectives of this plan as a recipient of an Epidemiology and Laboratory Capacity (ELC) cooperative agreement with CDC.

Surveillance. Surveillance is the key to recognizing new or emerging infectious diseases and to tracking the occurrence of more established ones. A well-designed, well-implemented surveillance program can detect unusual clusters of disease, document the geographic and demographic spread of an outbreak, and estimate the magnitude of the prob-

Doctor Davis is the Chief Medical Officer and State Epidemiologist for Communicable Diseases, Wisconsin Division of Public Health, Department of Health and Family Services and Adjunct Professor, Departments of Preventive Medicine and Pediatrics, University of Wisconsin Medical School, Madison, WI. Address correspondence to: Jeffrey P. Davis, MD, Wisconsin Division of Public Health, Department of Health and Family Services, Box 2659, Madison, WI 53701-2659, FAX 608.266.2906.

lem. Wisconsin has been a leader in identifying and responding to new syndromes or unusual clinical manifestations of existing pathogens and in detecting emerging pathogens (Table 1).

An adequate infectious disease surveillance system should include: 1) a mechanism to detect sporadic cases or clusters of unusual diseases or syndromes in addition to those officially reportable; 2) laboratories capable of identifying and characterizing infectious agents; 3) an information system to facilitate analysis of reportable or other unusual health events and dissemination of summary data; and 4) a mechanism to provide feedback to reporting agencies and individuals and facilitate investigation and control activities of the appropriate local and state agencies. The WDPH has made significant progress in building the infrastructure necessary to detect and respond to emerging and re-emerging infectious diseases. Following initial receipt of ELC funds from the CDC in 1997, the WDPH Communicable Disease Epidemiology Section (CDES), in collaboration with the Wisconsin State Laboratory of Hygiene (WSLH) and other public health partners, established or enhanced several major components of its surveillance network. Examples include the sentinel physician surveillance network for influenza-like illness, laboratory based surveillance of invasive bacterial diseases and collection of isolates, laboratory testing capacity for respiratory infections, pulsed-field gel electrophoresis and polymerase chain reaction to develop molecular epidemiology capacity, and electronic linkage with Wisconsin infection control practitioners.

WDPH staff contribute to strengthening national and global capacity to monitor and respond to emerging infectious diseases through reviewing information on dedicated listservs, participating in the National Electronic Telecommunications System for Surveillance, and posting of epidemiologic and laboratory information on a variety of electronic venues such as PulseNet, a national molecular subtyping network for foodborne disease surveillance that received an American Innovations in Government Award in 1999.[6] Increasingly, as a result of rapid communication, enhanced laboratory technology and global commerce, outbreaks involve patients and public health agencies that are widely scattered. This has been evident in Wisconsin during recent investigations of multistate outbreaks including *Salmonella muenchen* infections associated with contaminated alfalfa sprouts, *Listeria monocytogenes* infections associated with contaminated hot dogs, hepatitis A virus transmitted by frozen strawberries, and a variety of outbreaks of *Escherichia coli* 0157:H7 infections.[7-10] Included in this issue is a summary by Proctor and Davis of the broad experience with *E. coli* 0157:H7 infections in Wisconsin during the 1990s.[10]

Table 1. Recognition of and response to some new syndromes, emerging pathogens or unusual clinical manifestations of existing pathogens by year of initial recognition or response, Wisconsin, 1979-2000

1979:	Toxic shock syndrome associated with *Staphylococcus aureus*, menstruation and tampon use
1979:	Surveillance for Lyme disease and tick vectors in response to first reported cluster of cases west of the eastern seaboard
1983:	Initial Wisconsin AIDS cases reported
1985:	Blastomycosis outbreak associated with a beaver dam with isolation of *Blastomyces dermatitidis* from natural setting
1993:	Massive waterborne outbreak of *Cryptosporidium* infections associated with a public drinking water supply
1994:	Non-invasive gastrointestinal illness caused by *Listeria monocytogenes*
1996:	Response to the initial reports of human granulocytic ehrlichiosis
1997:	Initial Wisconsin case of hantavirus pulmonary syndrome
1997:	Shell egg-associated *Salmonella Enteritidis* outbreaks and successful egg diversion intervention
1998:	Leptospirosis outbreak among triathletes
2000:	Response to anthrax-related hoax events

Bioterrorism preparedness. In 1999 the WDPH received CDC funding for public health preparedness for and response to bioterrorism events. During this five-year project, the WDPH in collaboration with the WSLH and City of Milwaukee Health Department will: 1) enhance systems for rapid detection of unusual occurrences of illness that may be the result or biologic or chemical terrorism; 2) expand epidemiologic capacity to investigate health threats posed by bioterrorism; and 3) enhance core diagnostic capabilities in the public health and major laboratories to conduct rapid and accurate diagnostic and reference testing for the biological agents likely to be used in terrorist attacks. In addition, the WDPH, in collaboration with the University of Wisconsin-Madison Department of Information Technology, has initiated development of a statewide health alert and training network to provide for rapid dissemination and exchange of key information over the Internet, train health workers, and facilitate organizational capacity to respond to bioterrorism or other health threats.

Antibiotic resistance. In partnership with the Marshfield Medical Research Foundation and the State Medical Society of Wisconsin as

part of the Wisconsin Antibiotic Resistance Network (WARN), the CDES in 1999 began monitoring antibiotic susceptibility of *Streptococcus pneumoniae* invasive isolates, and a WARN Task Force began developing respiratory disease-related clinical practice fact sheets to encourage judicious use of antibiotics. The WARN related projects integrate laboratory science and epidemiology to optimize public health practice by comparing and evaluating the efficacy of a variety of different approaches to reduce the occurrence of antibiotic resistance through judicious antibiotic use. Included in this issue is the initial report by Belongia et al. of statewide rates of pneumococcal resistance to penicillin and other antibiotics.[11]

New reportable diseases. On April 1, 2000, Wisconsin's revised administrative rules regarding the control of communicable diseases were enacted, in part, to make the rules consistent with current public health knowledge and practice in the evolving areas of emerging infections and public health response to bioterrorism-related events. The revised rules include the addition of 19 diseases and conditions that are now officially notifiable (reportable) in Wisconsin. The complete list of these diseases and conditions is included in Table 2.

AIDS and HIV Infections

Working closely with its many partners throughout Wisconsin, the WDPH AIDS/HIV Program has been providing services since 1984 to prevent transmission of HIV and reduce the occurrence of the adverse effects of HIV-related disease among those infected. These activities, including health education, HIV counseling and testing, partner notification and life care services, have had positive impacts. Included in this issue are a concise and educational report by Hoxie et al. of epidemiologic trends of HIV infections in Wisconsin during 1983 through 1999 and a very useful summary by Vergeront et al. of state and national HIV-related resources for clinicians and patients.[12,13]

HIV case reports increased throughout the 1980s, then reached a plateau in the early 1990s; between 1990 and 1993 an average of 667 new cases were reported each year. Since 1993, the number of new cases reported annually has tended to decline. In 1999 375 new cases of HIV infection were reported; a 44% decrease compared to the 1990-1993 average. Between July 1998 and June 1999 the incidence of newly reported AIDS cases in Wisconsin (3.5 per 100,000) was the 10th lowest among all states.[12] During the past decade, there have also been substantial advances in the treatment of HIV infection and AIDS. Important among these has been the development of new and highly active antiretroviral drugs. These drugs have had a profound effect on the prognosis of HIV infection, but they are expensive. To assist persons who need these important medications, the AIDS/HIV Program administers the AIDS/HIV Drug Reimbursement Program (ADRP). Wisconsin ADRP expenditures increased from $209,479 in 1993 to $2.4 million in 1999.[12,13]

The benefit of improved treatment is clear. The average number of days hospitalized and the average annual cost of hospitalization for persons with AIDS decreased from 18.5 days and $20,137 in 1990 to 3.6 days and $6,548 in 1997. While the number of persons alive and reported with HIV infection increased by 29% between 1993 and 1999, the number of deaths among persons reported with HIV infection decreased 64% (335 to 120).[12]

While progress has been made, there is no room for complacency in our efforts to combat HIV infection and AIDS. The prospects for an actual cure, or safe and effective vaccines to prevent HIV infection, are years away at best. The challenge for the future is to continue to work to reduce the incidence of HIV infection, particularly among racial and ethnic minorities. At the same time, it is important that efforts aimed at early diagnosis and treatment of HIV infection be expanded, and that the benefit of new therapies be available to all those in need.

Sexually Transmitted Diseases (STDs)

During 1997-1999 cases of reportable STDs (syphilis, gonorrhea, *Chlamydia trachomatis* infections, primary genital herpes infections) comprised 75% of all case reports of notifiable diseases (excluding varicella) submitted to the WDPH. Breaches in safe sexual practice are of particular concern given the three- to six-fold increased likelihood of transmitting or acquiring HIV infection with concomitant STDs. The increased HIV acquisition and transmission risks are also associated with other highly prevalent STDs including herpes simplex virus infections, trichomoniasis, bacterial vaginosis and human papillomavirus infections that are not notifiable infections. Indeed, the number of infectious agents that are sexually transmittable is far greater than the relatively small number of STDs that are formally addressed in STD prevention and control programs. This adds to the complexity of STD prevention and control activities.

As an important antecedent to contemporary efforts to adequately address the prevention and control of STDs, the following statement from the Institute of Medicine *Summary Report, The Hidden Epidemic: Confronting Sexually Transmitted Diseases* encapsulates the critical issues and obstacles associated with the STD epidemic and the multifaceted approach needed to contend with it.

Table 2. Diseases and conditions officially reportable in Wisconsin as of April 1, 2000. Reprinted from Chapter HFS 145, APPENDIX A, COMMUNICABLE DISEASES

CATEGORY I

The following diseases are of urgent public health importance and shall be reported **IMMEDIATELY** to the patient's local health officer upon identification of a case or a suspected case. In addition to the immediate report, complete and mail an Acute and Communicable Diseases Case Report (DOH 4151) to the address on the form within 24 hours. Public health intervention is expected as indicated. See s. HFS 145.04 (3) (a).

- Anthrax [1,4,5]
- Botulism [1,4]
- Botulism, infant [1,2,4]
- Cholera [1,3,4]
- Diphtheria [1,3,4,5]
- Foodborne or waterborne outbreaks [1,2,3,4]
- *Haemophilus influenzae* invasive disease, (including epiglottitis) [1,2,3,5]
- Hantavirus infection [1,2,4,5]
- Hepatitis A [1,2,3,4,5]
- Hepatitis E [3, 4]
- Measles [1,2,3,4,5]
- Meningococcal disease [1,2,3,4,5]
- Pertussis (whooping cough) [1,2,3,4,5]
- Plague [1,4,5]
- Poliomyelitis [1,4,5]
- Rabies (human) [1,4,5]
- Ricin toxin [4,5]
- Rubella [1,2,4,5]
- Rubella (congenital syndrome) [1,2,5]
- Smallpox [4,5]
- Tuberculosis [1,2,3,4,5]
- Yellow Fever [1,4]

CATEGORY II

The following diseases shall be reported to the local health officer on an Acute and Communicable Disease Case Report (DOH 4151) or by other means within 72 hours of the identification of a case or suspected case. Public health intervention or other expected action is indicated in the footnotes. See s. HFS 145.04 (3) (b).

- Amebiasis [3,4]
- Arboviral infection (encephalitis/meningitis) [1,2,4]
- Babesiosis [4,5]
- Blastomycosis [5]
- Brucellosis [1,4]
- Campylobacteriosis (campylobacter infection) [3,4]
- Cat scratch disease (infection caused by *Bartonella* species) [5]
- Cryptosporidiosis [1,2,3,4]
- Cyclosporiasis [1,4,5]
- Ehrlichiosis [1,5]
- Encephalitis, viral (other than arboviral)
- *E. coli* 0157:H7, and other enterohemorrhagic *E. coli*, enteropathogenic *E. coli*, enteroinvasive *E. coli*, and enterotoxigenic *E. coli*: [1,2,3,4]
- Giardiasis [3,4]
- Hemolytic uremic syndrome [1,2,4]
- Hepatitis B [1,2,3,4,5]
- Hepatitis C [1,2]
- Hepatitis non-A, non-B, (acute) [1,2]
- Hepatitis D [2,3,4,5]
- Histoplasmosis [5]
- Kawasaki disease [2]
- Legionellosis [1,2,4]
- Leprosy (Hansen disease) [1,2,3,4,5]
- Leptospirosis [4]
- Listeriosis [2,4]
- Lyme disease [1,2]
- Malaria [1,2,4]
- Meningitis, bacterial (other than *Haemophilus influenzae* or meningococcal) [2]
- Meningitis, viral (other than arboviral)
- Mumps [1,2, 4,5]
- Mycobacterial disease (nontuberculous)
- Psittacosis [1,2,4]
- Q Fever [4,5]
- Reye syndrome [2]
- Rheumatic fever (newly diagnosed and meeting the Jones criteria) [5]
- Rocky Mountain spotted fever [1,2,4,5]
- Salmonellosis [1,3,4]
- Sexually transmitted diseases:
  - Chancroid [1,2]
  - *Chlamydia trachomatis* infection [2,4,5]
  - Genital herpes infection (first episode identified by health care provider) [2]
  - Gonorrhea [1,2,4,5]
  - Pelvic inflammatory disease [2]
  - Syphilis [1,2,4,5]
- Shigellosis [1,3,4]
- Streptococcal disease (all invasive disease caused by Groups A and B Streptococci)
- *Streptococcus pneumoniae* invasive disease (invasive pneumococcal disease) [1]
- Tetanus [1,2,5]
- Toxic shock syndrome [1,2]
- Toxic substance related diseases:
  - Infant methemoglobinemia
  - Lead intoxication (specify Pb levels)
  - Other metal and pesticide poisonings
- Toxoplasmosis
- Trichinosis [1,2,4]
- Tularemia [4]
- Typhoid fever [1,2,3,4]
- Typhus fever [4]
- Varicella (chicken pox) - report by number of cases only
- Yersiniosis [3,4]
- Suspected outbreaks of other acute or occupationally-related diseases

CATEGORY III

The following diseases shall be reported to the state epidemiologist on an AIDS Case Report (DOH 4264) or a Wisconsin Human Immunodeficiency Virus (HIV) Infection Confidential Case Report (DOH 4338) or by other means within 72 hours after identification of a case or suspected case. See s. 252.15(7)(b), Stats., and s. HFS 145.04 (3) (b).

- Acquired Immune Deficiency Syndrome (AIDS) [1,2,4]
- Human immunodeficiency virus (HIV) infection [2,4]
- CD4+ T-lymphocyte count<200/L, or CD4+ T-lymphocyte percentage of total lymphocytes of <14 [2]

Key

[1]Infectious diseases designated as notifiable at the national level.

[2]Wisconsin or CDC follow-up form is required. Local health departments have templates of these forms in the Epinet manual.

[3]High-risk assessment by local health department is needed to determine if patient or member of patient's household is employed in food handling, day care or health care.

[4]Source investigation by local health department is needed.

[5]Immediate treatment is recommended, i.e., antibiotic or biologic for the patient or contact or both.

"STDs are hidden epidemics of enormous health and economic consequence in the United States . . . The first hurdle will be to confront the reluctance of American society to openly confront issues surrounding sexuality and STDs . . . To successfully prevent STDs, many stakeholders need to redefine their mission, refocus their efforts, modify how they deliver services, and accept new responsibilities . . . A successful national initiative to confront and prevent STDs requires widespread public awareness and bold national leadership from the highest levels."[14]

Chlamydia trachomatis. Working closely with the WSLH and the WDPH Family Planning Program, a statewide selective screening program was implemented in 1985 in Wisconsin to screen for *C. trachomatis* infections among sexually active women. Risk indicators identified through prevalence studies conducted in urban and rural family planning clinics provided the basis for development of screening criteria.[15,16] Reliance on effective screening criteria to minimize the cost per infection detected is critical at a time when new test technology and treatment have greatly amplified the cost of detecting and treating this infection. After expected increases in reported morbidity in Wisconsin during the years following implementation of directed screening, levels of reported *Chlamydia* infections declined from a high of 15,299 in 1989 to a low of 10,298 in 1996. Test positive rates as a surrogate for prevalence estimates of *Chlamydia* infection in women attending rural and urban family planning clinics declined from 10-20% in 1985 to 3-7% in 1996. Between 1989 and 1998 reported hospital discharge diagnoses of pelvic inflammatory disease (PID) and ectopic pregnancy (EP) in Wisconsin also declined from 77 to 37 cases of PID per 100,000 women ages 15-44 and from 95 to 36 cases of EP per 100,000 women ages 15-44 (unpublished data, STD Control Section, WDPH).

With greater access and widespread use of highly sensitive amplified molecular assays coupled with directed screening of populations at highest risk, Wisconsin experienced an observed increase in reported *C. trachomatis* related morbidity from 11,097 cases in 1997 to 13,851 cases in 1998. Non-invasively obtained urine samples for molecular testing have also enhanced convenience of testing males and asymptomatic females. Indeed, *Chlamydia* morbidity increases were noted in 9 of 10 federal public health regions in 1998 and these trends are most likely due in part to test method enhancements and expanded and focused screening activities.[17] As the primary objective of providing screening services to women in need are met, secondary objectives include prevention of other infertility-related STDs. Among these, a 29% increase in reported gonococcal infections occurred in Wisconsin from 1997 (4,928 cases) to 1998 (6,337 cases).

For both *C. trachomatis* and gonococcal infections the disturbing increase in morbidity, greatest among 15-19 and 20-24 year old age groups, highlights the need to focus resources on primary prevention measures. These include patient and sex partner treatment services and disease intervention services. A recent study of partner notification services demonstrated a reduction in the incidences of *C. trachomatis* infection, PID, and other sequelae.[18] Notification of female sex partners of men diagnosed with *Chlamydia* infections saved $3000 per episode of PID prevented; notification of male partners saved $1600 per episode of recurrent infection prevented.

Syphilis. Since 1994, the STD Control Section (STD Program), WDPH has embarked on collaborative efforts with over 20 community based-organizations (CBOs) to jointly provide education, medical screening for syphilis and HIV and condom distribution. In conjunction with STD Program disease intervention staff assigned to work in the City of Milwaukee Health Department (MHD) STD Clinic, the STD Program has worked with outreach workers from CBOs to refer individuals at high-risk for STDs to the clinic for a screening examination. The STD Program has identified new cases of early syphilis based upon referrals from the CBO outreach workers. An example of such collaboration involves a contract with ASHA Family Services, Inc. to train two staff members to perform disease intervention activities in high syphilis morbidity areas in Wisconsin. Another example involves the STD Program, Milwaukee County Corrections Department and MHD initiated syphilis and HIV screening project among individuals incarcerated in the Milwaukee County Jail. Among the initial 1492 inmates tested at the jail, six cases of syphilis and seven HIV infections were newly identified. In addition to HIV and other STD prevention, these programs will help to achieve quicker disease intervention on early syphilis cases as part of state participation in the national plan to eliminate syphilis from the United States.[19]

While there is a great impact on society imparted by STDs, the STD Program estimates more than $4 million in STD-related health care costs are saved annually in Wisconsin due to public health prevention efforts. Improvements in timely notification and treatment of sex partners will require an examination of current roles and responsibilities. Partners of patients with known STDs need to be **tested** and treated on the same

day. Empiric antibiotic treatment of a male partner (of a woman with a treatable bacterial STD) without examination and **testing** can result in missed detection of other serious STDs (including HIV infection) and in compromised follow-up investigation, as only a positive test result can justify partner notification of potentially infected females. Thus, a reservoir of unidentified and untreated partners is perpetuated which escalates incidence, reinfection, and long term and costly reproductive sequelae. Efforts to enhance STD-related education and focus STD screening and follow-up activities on populations at greatest risk are important population-based approaches needed to manage the significant problem of high STD prevalence.

Vaccine Preventable Diseases (VPDs)

Childhood immunization schedule. During recent years the number of diseases that are vaccine preventable and the complexity of the Recommended Childhood Immunization Schedule have steadily increased.[20] Varicella (1995), hepatitis A (1995), and the 7-valent pneumococcal conjugate (2000) vaccines have all recently been FDA licensed. Varicella vaccine is routinely recommended for administration to children between 12-18 months of age and catch-up vaccination is recommended for children and adults without reliable histories of varicella. Hepatitis A vaccine is recommended for routine use in children 2 years and older in selected states and regions of the United States (exceeding an annualized incidence of 20 cases per 100,000 population during 1987-1998) including the City of Milwaukee. The pneumococcal conjugate vaccine is approved for use in infants beginning at 2 months of age and in children up to 5 years old to prevent invasive pneumococcal disease, but will also impact on the occurrence of pneumonia, severe pneumonia, acute otitis media, otitis media related outpatient visits and the placement of PE tubes. The varicella and hepatitis A vaccines are among vaccines formally included in the Recommended Schedule for 2000.[20]

With striking progress toward global eradication of poliomyelitis and the reduced likelihood of importation of wild poliovirus into the United States, an all-IPV (inactivated poliovirus vaccine) schedule is now recommended by the Advisory Committee on Immunization Practices (ACIP) for routine childhood polio vaccination in the United States to eliminate the risk of vaccine associated paralytic polio (VAPP). The Recommended Schedule for 2000 incorporates this recommendation.[20] The last three cases of

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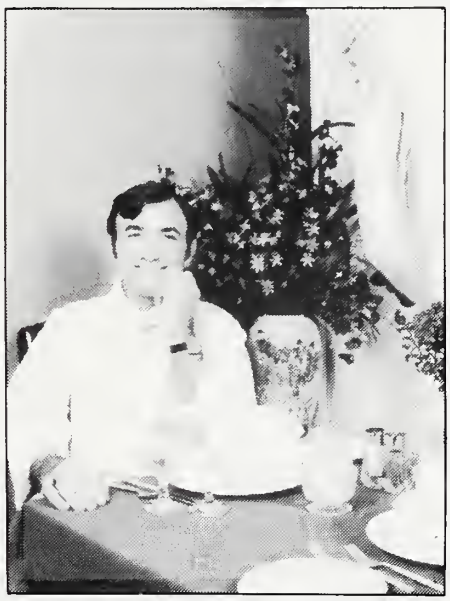

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wild poliovirus paralytic disease in Wisconsin residents occurred in 1979 during a multistate outbreak among the Amish. The last case of VAPP in a Wisconsin resident occurred in 1988.

Wisconsin Immunization Registry (WIR). An emerging mechanism in Wisconsin that will greatly enhance vaccine and immunization related record keeping, record access, inventory control and trend analysis is the WIR. The WIR is currently functioning and is accessible to physicians in private practice. It is a true browser-independent Internet application. Important design features of the WIR involve inclusion of historic immunization record data from public and private sites, weekly integration of vital records data to facilitate timely initiation of immunization series, real-time client matching and elimination of duplication, and HL7 standard electronic data submission. There are four levels of security for access to the system and all data are encrypted prior to Internet transmission. A mechanism exists for parents to opt out of the WIR. The system is designed to follow the Recommended Childhood Immunization Schedule but can be tailored to a physician's immunization schedule. Additional WIR features include generation of reminder and recall notices, tracking vaccine inventory, supporting HEDIS reporting and computer assisted immunization assessments. The WIR will readily allow inclusion or newly-licensed vaccines and changes in policy involving use of existing vaccines. The WIR will facilitate continuous assessment of vaccination coverage statewide and in selected areas as needed. This will help with recognition of pockets of need to enhance timely provision of vaccines.

National Immunization Survey (NIS). We currently depend on the NIS to examine vaccination coverage among children 19–35 months of age.[21] The NIS is a representative continuous survey involving systematic random selection of subjects, phoned interviews and validation of actual provider immunization records. Vaccines included in NIS data are DTaP/DTP, polio, *Haemophilis influenzae* type b (Hib,) MMR, hepatitis B and varicella. Individual vaccine and series complete data (defined for 19–35-month-old children as four DTaP/DTP, three polio, one MMR and three Hib vaccine doses or 4:3:1:3) are included in NIS reports. During 1999 the 4:3:1:3 series completeness was 84.5% in Wisconsin (74.1% in Milwaukee County and 87.6% in the other 71 counties) which was the eighth highest among states. During July 1998

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to June 1999, 87% received three hepatitis B vaccinations and 43% received varicella vaccine. These data represent improvement from NIS rates of 78% 4:3:1:3, 84% three hepatitis B, and 33% varicella vaccination during July1997 to June 1998 (*www.cdc.gov/nip/coverage/data.htm* #July 1998 to June1999).

Vaccine safety. Vaccine safety is central to all immunization-related activities. In July 1999, a theoretical concern arose regarding the presence of thimerosal, which contains ethyl mercury, as a preservative in certain vaccines.[22] The FDA determined that some infants who received thimerosal-containing vaccines during several visits may have been exposed to more mercury than recommended by federal guidelines for mercury exposure. However, there were no data or evidence of any harm caused by the level of exposure that some children may have encountered in following the existing immunization schedule. Because there were no thimerosal-free vaccine options for hepatitis B (Hep B) vaccine, the American Academy of Pediatrics (AAP) and the CDC recommended that the birth dose of hepatitis B vaccine be delayed until infants reached 2-6 months of age.[22] By September 1999, one of the manufacturers began distributing a preservative-free unit dose formulation of Hep B vaccine and both the AAP and the CDC recommended that hospitals resume routine infant Hep B vaccination policies.[23] The WDPH Vaccine Preventable Diseases Section (Immunization Program) surveyed birthing hospitals in Wisconsin to assess the impact of the thimerosal advisory on their infant Hep B vaccination programs. Prior to July 1999, 74 (80%) of 93 responding hospitals were routinely offering Hep B vaccine to approximately 51,000 infants. By March 2000, only 46 (49%) of the hospitals were routinely offering Hep B vaccine to approximately 27,000 infants (unpublished data, VPD Section, WDPH). The most frequently given reason for not resuming routine infant Hep B vaccination was physician desire to switch to a combination Hib-Hep B vaccine (Comvax) which cannot be given before 6 weeks of age. The thimerosal advisory has resulted in a 47% decrease in the number of infants being offered Hep B vaccine prior to hospital discharge. While it is possible that the convenience of a combination vaccine during the first year of life will offset this drop in early first dose coverage, this is an unfortunate trend that can be reversed by resuming the administration of the birth dose using thimerosal-free hepatitis B vaccine.

Progress in VPD occurrence. The improvements in immunization levels using a variety of safe and effective vaccines in combination with timely activities, such as school immunization laws and enhanced efforts to complete the recommended immunization series in 2-year-olds, has had a dramatic impact on the occurrence of VPDs in Wisconsin (Table 3). In large part due to school immunization laws, measles, mumps and rubella are near elimination in Wisconsin. In 1999, no cases of measles or rubella and three cases of mumps were reported among Wisconsin residents. Although school-wide coverage with Hep B vaccine under the school immunization law will not be achieved in Wisconsin until school year 2003-2004 (grades K-2 and 7-9 were included during school year 1999-2000), the proportion of reported cases of acute hepatitis B in Wisconsin occurring in persons 0-19 years old has decreased slightly from 12% of cases in 1996 to 11% of cases in 1998. Hib conjugate vaccines were initially available for use in infants in 1990. The rapid and widespread acceptance of these vaccines resulted in fewer than four cases cases of Hib meningitis reported annually among Wisconsin children since 1994 and only three cases of any invasive Hib infection reported in 1999.[24] Included in this issue is a report by Enders et al. of the dramatic impact of Hib conjugate vaccines on the occurrence of Hib meningitis in Wisconsin.[24]

While exciting prospects for new vaccines and vaccine delivery systems loom, let us not forget that the two vaccine preventable diseases associated with by far the greatest annual mortality are pneumococcal disease and influenza. In 1997 there were 1768 pneumonia and influenza (P and I) deaths in Wisconsin and the age adjusted P and I death rate was 11.5 per 100,000 population.[25] While the pneumococcal conjugate vaccine has recently been recommended by the ACIP for all children 23 months old and younger and for children 24-59 months old who are at high risk of serious pneumococcal disease (CDC *http://www.cdc.gov/od/oc/media/pressrel/r2ko626.htm*), the 23-valent pneumococcal polysaccharide vaccine remains central to the prevention of pneumococcal disease in children and adults and its use needs to be intensified.[26] The 1997 pneumococcal vaccination rate of 42.6% among Wisconsin residents 65 years and older was below the national median of 45.9% and rates in all states were below the Healthy People 2000 target of 60%. The 1997 influenza vaccination rate of 66.1% among Wisconsin residents 65 years and older just exceeded the national median of 66% and exceeded the Healthy People 2000 target of 60%; however, national vaccination rates for persons under 65 years who are at high risk was woefully low (less than 30%) despite reported benefits of vaccination.[27] The ACIP recommendations for the prevention and control of influenza for the 2000-2001 season[28] can be accessed at *http://www.cdc.gov/ncidod/diseases/flu/fluvirus*. Among five principal

Table 3 Trends in selected vaccine preventable diseases (VPDs) by three 5-year intervals, 1975-1999, Wisconsin

VPD	Mean annual number of reported cases		
	1975-79	1985-89	1995-1999
Measles	2045	275	3
Mumps	2948	476	3
Rubella	806	2	<1
Pertussis	51	177	174
Tetanus	1	1	1
Hib*	N/A	114	2
Hepatitis B**	N/A	110	79

* *Haemophilus influenzae* type b meningitis; Hib invasive disease officially reportable as of April 1, 2000. In 1999, 3 cases of invasive Hib infection in children <10 years old.
** Acute cases only
*** Last case of diphtheria reported in 1982.

changes included in these recommendations, the age for universal influenza vaccination has been lowered to 50 years from 65 years.

Tuberculosis

The worldwide scourge of tuberculosis (TB) continues with deadly force while concomitantly the United States is posing to eliminate it. Globally, one-third of the world's population is infected with *Mycobacterium tuberculosis* and annually more than three million people die as a result of their infection. International migration and changes in health care systems impact on the United States and countries with relatively low rates of tuberculosis. In the United States, federal resources to control tuberculosis were reduced in the early 1980s following many years of progressive declines of reported tuberculosis morbidity. A striking increase in tuberculosis morbidity, an estimated 39,000 cases above the expected morbidity during 1985-1992, accompanied by emergence of multiple drug resistant infections and TB among persons with AIDS, ultimately resulted in renewed and increased funding to prevent and control TB.[29] Nationally-reported TB decreased from 26,673 cases in 1992 to 17,528 cases in 1999, the lowest ever reported. However, while reported cases of TB in US born persons decreased more than 40%, the number of cases in foreign-born persons remained about the same and the proportion of cases in foreign-born persons increased from 22% in 1988 to 43% in 1998.[30] In Wisconsin, annual TB case rates have varied little since 1990. In 1999, 110 cases were reported, 43% occurred in foreign-born persons, and the statewide incidence of 2.1 cases per 100,000 persons was the 10th lowest among the 50 states and less than one-third the national rate.

A recently (May 4, 2000) released Institute of Medicine Report concludes that TB can be eliminated.[31] Elimination is defined as an annual incidence of less than one case of active TB per million persons which equates to less than six reported cases per year in Wisconsin. However, the elimination effort will require increases in resources specifically focused on TB for research to improve diagnostic testing and develop effective vaccines, increased emphasis on testing populations with high incidences of TB (eg. persons exposed to infectious persons, persons born in high incidence countries, prisoners and others) and treating latent infections, and increased US participation in global efforts to prevent and control TB.[31] In recently released guidelines for treatment of latent TB, it is stressed that any decision to test a person for TB is commensurate with a decision to treat any diagnosed infection.[32] Of note, because the proportion of isolates of *Mycobacterium tuberculosis* that are resistant to one or more drugs exceeds 4% in Wisconsin, four drugs should be prescribed as the initial regimen for treatment of suspected or confirmed active TB disease.

Newly enacted Wisconsin statutes and regulations will facilitate management of TB. Statute 252.07 clearly defines the local health officer role regarding confinement of persons with TB. A local health officer has the authority to confine (for up to 72 hours) persons with infectious TB who have been non-compliant with other health orders. Also of note, health departments may petition the court to confine concompliant TB patients who are not currently infectious. Administrative Rule HFS 145.09 stipulates that when a physician treats a patient with active TB, the American Thoracic Society guidelines [33] must be considered in formulating the treatment. The local health officer has the authority to order patients to maintain isolation while infectious and to release patients from isolation when no longer infectious. These decisions are based on the absence of acid fast bacilli from sputum smears, clinical improvement, time on medication, arrangements for post-isolation care and the assurance that the patient is likely to comply with the remainder of treatment.

The newly revised 4th edition of the *CDC Core Curriculum on Tuberculosis: What the Clinician Should Know* is now available. This excellent document and other tuberculosis-related material are available on the Internet at *http://www.cdc.gov/nchstp/tb*. Also, the WDPH Tuberculosis Program now includes a consulting physician in addition to four full-time staff. Please call 608.266.9692 for more information.

Conclusion

In a CDC article on the control of infectious diseases as one of ten great public health achievements

during the 20th century is a statement noting that during the last quarter of the 20th century the appearance of AIDS and HIV infection, the re-emergence of tuberculosis and an increase in infectious diseases related mortality provided compelling evidence that as long as microbes can evolve, new diseases will appear.[34] In turn, this phenomenon underscores the importance of disease prevention and the attendant need to monitor the factors that may encourage disease emergence or reemergence. The federal government has recognized that the protection of the public's health requires improved capacity for disease surveillance and outbreak response at local, state, national and global levels in addition to enhancement of epidemiologic methods, continued vaccine and antimicrobial development and research regarding environmental and other factors that facilitate disease emergence.[5,34] Wisconsin's state and local public health agencies, along with our traditional and nontraditional partners in disease prevention and control must all share in meeting the diverse challenges of infectious diseases during the 21st century.

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Overuse of Antibiotics Leads to "Super Bugs"

by Marc Kennedy, special to WMJ

A generation ago, physicians concentrated on infectious pathogens and how to control them; now they are more concerned about the ability of these diseases to develop immunity to standard antibiotics.

"The shift in focus has gone from fighting infectious disease to antibiotic use," said Edward Belongia, MD, infectious disease epidemiologist at the Marshfield Medical Research Foundation and principal investigator for the Wisconsin Antibiotic Resistance Network (WARN). "The new reality is that many doctors used to use antibiotics often for a variety of reasons. Now, this is no longer appropriate. And we in the medical community need to use them when we have good strong clinical evidence that warrants their use so we don't lose the magic bullet. We need to conserve these drugs and use them in situations where they will benefit patients. If we continue to waste them on illnesses for which they weren't intended we will increase the spread of resistant bacteria, which will cause infections we can't treat."

This is a major focus of efforts at the Marshfield Clinic, associated with similar work being spearheaded at the US Centers for Disease Control and Prevention in Atlanta. The CDC's national emerging infectious disease plan targets specific categories of emerging infectious disease problems and particular groups of people at special risk. Antimicrobial resistance is one of these major components.

"It's the biggest problem we have in infectious disease," said Michael Frank, MD, Medical College of Wisconsin. "Bigger than HIV. We know how to prevent HIV; we don't know how to prevent antimicrobial resistance. We know it helps to limit antimicrobial use. But that is difficult to do.

"It is an area where primary care providers play a big role. You don't need to prescribe antibiotics for flu or head colds, and they are used up to three times as much as needed for infections. This type of overuse is related to increasing resistance. We're creating superbugs that are resistant. If you are unlucky enough to get one of these, it is very difficult to treat."

Antibiotic resistance is occurring among the general populace as well as in in-patient settings.

"Outside of hospitals, problems with streptococcal pneumonia are growing significantly," said David Andes, MD, infectious disease specialist at the University of Wisconsin Medical School. "It is the most common pathogen of the upper and lower respiratory tract. And, 40 percent of its isolates are resistant to penicillin. Now it has begun to be resistant to other antibiotics as well. In hospitals, we're continuing to see problems with vancomycin-resistant enterococci (VRE) and MRSA (methicillin-resistant *staphylococcus aureus*)."

In hospitals and other health care environments such as nursing homes, MRSA has become a prevalent nosocomial pathogen. It is mainly transmitted through blood, body fluids, secretions, excretions and contaminated items from the hands of one person to another. MRSA carriers are usually health care workers, who can serve as reservoirs for the organism for weeks or months.

Standard precautions include diligent handwashing, using gloves, masks and eye protection or face shields and gowns properly, handling medical devices that may become contaminated and handling laundry appropriately.

"Fortunately MRSA is not a big problem in Wisconsin hospitals, as is VRE," said Andes. "In many communities all patients that come in with any type of staphylococcal infection are assumed to have MRSA. Luckily, this is not the case in Wisconsin so far."

However, the problem of VRE is growing in Wisconsin hospitals as well as in other parts of the country, according to Andes. The CDC has published guidelines for hospitals to help those with VRE contamination attempt to prevent and control the resistant disease. The Hospital Infection Control Practices Advisory Committee (HICPAC) recommends:

- using vancomycin prudently,
- educating hospital staff regarding vancomycin resistance,
- detecting and promptly reporting vancomycin resistance in enterococci and other gram-positive microorganisms by hospitals' microbiology laboratory, and
- immediately implementing appropriate infection-control measures to prevent person-to-person transmission of VRE.

These guidelines and other information are available on the CDC Web site: *http://www.cdc.gov/ncidod/vancom.htm*

Educating Patients and Physicians

"The CDC and the Infectious Disease Society of America are trying to address antibiotic resistance with guidelines on treating viral respiratory infections," said Andes. "They have published whole sections for treating sinusitis and pneumonia in children and of the importance of resistance of these pathogens.

"These organizations are trying to encourage prudent use of antimicrobials," he added. "It's difficult to do but we have to get doctors to alter how they have been prescribing drugs for patients. One strategy is to educate patients as well as physicians. Patients want antimicrobials and are disappointed when they don't get one. We've looked at patient education and satisfaction. If we educate patients about the appropriate use of antimicrobials and whether they really need them based on their type of illness, their satisfaction is greater than if we do not explain why we didn't prescribe something that will not work. But that's the problem. This effort takes time with patients. In today's world of HMOs it's difficult to take the time."

The Wisconsin Antibiotic Resistance Network (WARN) is also working to combat the growing problem of antibiotic resistance. WARN is a partnership between the Marshfield Medical Research Foundation, the State Medical Society, and the Wisconsin Division of Public Health. The five-year, US Centers for Disease Control and Prevention (CDC) funded project is dedicated to educating the public and physicians about judicious antibiotic use and the growing problem of antibiotic resistance.

WARN is using a variety of strategies to educate the public and physicians. Free patient educational materials will be available in late September on the WARN Web site (*www.wismed.org*). Also, WARN and the CDC are jointly sponsoring a state-of-the-art satellite conference titled "Management of Pediatric Respiratory Illness in the Era of Antibiotic Resistance." The free conference is October 12 from 12-1:30 p.m. and October 13 from 7:30-9 a.m. It will be downlinked to sites across the state. The conference features two nationally known experts in the area of antibiotic resistance, Richard Besser, MD, from the CDC and S. Michael Marcy, MD, from Kaiser Permanente. The conference brochure will be mailed in late August and will also be available on *www.wismed.org*.

> "The CDC and Infectious Disease Society of America are trying to address antibiotic resistance with guidelines on treating viral respiratory infections."
>
> *David Andes, MD*

New Treatments

In addition to efforts such as these, there is some additional good news. Pharmaceutical companies are keeping a step ahead of mutating organisms, for now.

"It is encouraging that there are a number of new classes of antimicrobials being developed to help combat resistant pathogens," said Andes. "For example, there is a new class of oxazolidinones which block protein synthesis that are active against Gram-positive organisms. These were just recently available in oral and IV delivery. We hope that the cost per patient per day — $84 — will preclude imprudent use. We always worry that the new treatments will be overused and ultimately will no longer work as the organisms mutate.

"There are advances in therapy," added Andes, "including a new generation of compounds called flouroquinolones, which are active against pneumonoccol infections. Then there is a new drug originally developed by Lilly, daptomycin, soon to be available by Cubist. It looks useful for treating Gram-positive infections in hospitalized patients. And, also, there are other new drugs called kytolides. One or two of those should be out in the next year. They will also be useful for resistant Gram-positive infections, especially respiratory infections."

Despite such developments, infectious disease experts warn about the importance of striking a delicate balance.

"We need to use these new drugs where we encounter resistance against current therapies,"

continued on page 28

Hepatitis C: A Hidden, Growing Problem

by Marc Kennedy, special to WMJ

John Husar, outdoors columnist with the Chicago Tribune, often traveled and wrote about the fishing and hunting in Wisconsin. A little over a year ago he revealed that he suffered from Hepatitis C virus. He wrote passionately about his fight with the disease, his need for a new liver and of raising awareness of both the serious nature of the disease as well as the need for more organ donors. Shortly after receiving a partial liver transplant from a live donor, he died of liver failure.

Husar's battle is not an isolated case. Though the data is incomplete, health care experts estimate that 3.9 million Americans have been infected with HCV, of whom 2.7 million are chronically infected. The US Centers for Disease Control and Prevention estimates that 36,000 new cases occur annually in the United States. But this is a rough estimate. One of the major hurdles to treating and preventing Hepatitis C is that infectious disease experts are having trouble discerning the extent of the infection.

"The big problem with Hepatitis C is that we have no accurate data," said Michael Frank MD, Associate Professor of Medicine, Division of Infectious Diseases at Medical College of Wisconsin. "There is an under-appreciated epidemic of this disease going on now in the United States. A lot of people have no idea they have the disease. People who have Hepatitis C can go for many years without detection and the effects are so latent. It doesn't cause symptoms for a couple decades."

If we do more screening, I bet we would find more incidence of the disease. There is a relatively new test for it. If it's caught early, it is treatable."

Though usually attributed to sexual transmission, IV drug use or through tainted blood products, added Andes, other methods have not been discounted, according to David Andes, MD, infectious disease specialist at the University of Wisconsin Medical School.

"There are theories about shared razor or even toothbrushes," Andes said "though we think it's likely sexual contact

that is responsible in these cases. The problem is that those carrying the disease are asymptomatic for so long it's hard to trace where they got it. Most people don't know they have it until they find out by accident during a routine laboratory test."

HCV presents as jaundice, fatigue, abdominal pain, loss of appetite, intermittent nausea and vomiting. The difficulty lies in the fact that only 25 to 30 percent of those who are infected are symptomatic.

Treating Hepatitis C

The sooner high-risk people get tested, the better, experts say. The further advanced the disease, the more difficult it becomes to treat. And, therapies available today are less than adequate.

"Unfortunately therapies are not optimal," said Andes. "They are difficult to administer and tolerate. There are experimental therapies, such as interferon alone or with ribavirin, an analogue nucleoside. Although results were initially promising, we're still unable to affect people's long-term outcome. Once we stop therapy, a significant percentage of patients' disease progresses again. And, with interferon, too many patients develop flu-like symptoms.

He added that hepatitis C is not difficult to diagnose, but the follow-up steps are not as easy. There is not enough data available to provide adequate guidelines at this point.

"The question is what do you do when you do diagnose it?" said Andes. "People find out when they donate blood. It is difficult to predict what will happen to them. For example, a blood donor gets a call from the Red Cross about an abnormal test. They encourage further tests with the primary care physician. The doctor would run additional tests to confirm it, then check liver enzymes. Depending on results, there are further tests to help prognosticate. Genotypic tests tell you the likelihood of the patient responding to therapy and how much virus is in the body. In the United States, the most common genotype is the least likely to respond to therapy."

All these unanswered questions make uncertain treatment planning, said Andes.

"We know how to treat patients who have elevated liver test results, but what do we tell them about the risk of transmitting the disease?" said Andes. "We don't know how contagious the disease is. And there are so many people out there who have it who don't know how they got it. It's in the hundreds of millions around the world. It's scary."

In screening for Hepatitis C, physicians should consider a patient at risk if he or she:

- √ was notified of receiving blood from a donor who later tested positive for hepatitis C;
- √ has ever injected illegal drugs, even if it was only experimental use once or twice decades earlier;
- √ received a blood transfusion or solid organ transplant before July, 1992;
- √ received a blood product for clotting problems produced before 1987;
- √ has ever been on long-term kidney dialysis;
- √ has evidence of liver disease (e.g., persistently abnormal ALT levels);
- √ is a health care worker with symptoms;
- √ has sexual contacts with infected persons;
- √ has multiple sex partners;
- √ is an infant born to an infected woman

[National Center for Infectious Diseases Viral Hepatitis C]

Resources

National Center for Infectious Diseases
888.4.HEP.CDC • 888.443.7232
http://www.cdc.gov/ncidod/diseases/index.htm
http://www.cdc.gov/ncidod/diseases/hepatitis/c/fact.htm

Hepatitis Foundation International
800.891.0707

CDC, Hepatitis Branch
888.443.7232 (4HEPCDC)

American Liver Foundation
800.223.0179 (GOLIVER)
888.443.7222 (4HEPABC)

National Digestive Diseases Information Clearinghouse
301.654-3810

Old Foes, New Enemies Appear on Infectious Disease Front

by Marc Kennedy, special to WMJ

Fifty years ago, it could take days, perhaps weeks, to travel from remote corners of the earth to populated areas. Today, it is a matter of days, sometimes hours, due to an expanded and rapid transportation system. While this mobility may be a boon to commerce and a blessing to travelers, this capability to swiftly convey people around the planet also opens an express lane for introducing exotic diseases to new areas.

"This problem transcends national boundaries," said Edward Belongia, MD, infectious disease epidemiologist at the Marshfield Medical Research Foundation and principal investigator for the Wisconsin Antibiotic Resistance Network (WARN). "Pathogens don't pay attention to borders. Today you can go from a remote area in Asia to downtown Manhattan in 12 to 15 hours."

Indeed, airlines, embassies and immigration officials take precautions to limit the possibilities of international travelers carrying more than souvenirs or business portfolios from one nation to another. Vaccines, medical records and passport stamps are all part of a concerted effort to keep the lid on Pandora's pandemic box of infectious diseases, such as the well-known lineup of cholera, typhoid, typhus, yellow fever and so on. But it isn't the usual suspects that worry infectious disease experts like Belongia. It's the newcomers that are likely to slip through that trouble him.

"We are beginning to run into emerging infectious diseases we haven't seen before," explained Belongia. "Last year in New York City there was evidence of West Nile virus (WNV). Birds were the source with mosquitoes the vector."

This year, West Nile virus has reappeared in birds in New York and other New England states, though there have been no reports of human infections.

"During that outbreak last year, there were 62 cases and seven deaths in people," said David Andes, MD infectious disease specialist at the University of Wisconsin Medical School. "And we can't ignore the potential danger of it spreading since birds migrate."

West Nile virus (WNV) was first reported in 1937 in the West Nile district in Uganda, according to the Centers for Disease Control. WNV was linked to an outbreak of severe human meningoencephalitis in Israel in 1957 and was noted in horses in Egypt and France in the early 1960s. It began to appear in Europe and North America in the late 1990s, causing equine and human encephalitis. It began presenting in birds last year in the United States. Evidence of WNV has emerged in New York, Maryland, Connecticut and New Jersey. Health care officials are taking the risk seriously. They have ordered chemical spraying to abate the mosquito population in several areas of New York City and surrounding areas, and a concert in Central Park was recently canceled due to a fear of potentially contaminating an estimated crowd of 30,000 by mosquitoes carrying WNV.

These new diseases — and some familiar ones — are receiving greater attention by experts. In mid-July more than 2,000 public health professionals met to discuss the problems such pathogens pose at the International Conference on Emerging Infectious Diseases. The program included current work on surveillance, epidemiology, research, communication and training, bioterrorism and prevention and control of emerging infectious diseases, both in the United States and abroad. [For updates, visit *http://www.cdc.gov/iceid/*].

"Back in 1967, the surgeon general at the time said that the war against infectious diseases has been won," said Belongia. "This counts as one of the most regrettable quotes in 20th century. Soon after that statement, we had AIDS, Ebola, Lyme disease and others."

Lyme Disease and Ehrlichiosis

Tick-borne diseases have origins closer to home. "Wisconsin is a hotbed for Lyme Disease," said Michael Frank, MD, Associate Professor of Medicine, Division of Infectious Diseases at Medical College of Wisconsin, "though it depends on where you are in the state. It's not so much a problem in Milwaukee, but more so in the north and west. Probably doctors should have an understanding of the risk of Lyme disease in their area. It's certainly not uniform throughout the state. It's overdiagnosed in certain areas of the state and underdiagnosed in others."

"There is a vaccine for Lyme disease," Frank added, "but it is

somewhat controversial. There are concerns that it may trigger arthritis. This is still unclear; it's a theoretical concern. However, the vaccine is recommended for people who have an occupational or recreational exposure. So, you need to know the risks in the areas in which you work and recreate. A game warden or golf course worker or anyone who routinely removes brush may want to be vaccinated. The same for those who hunt, fish, hike or camp in areas known for high concentrations of ticks. In these cases the vaccine would be worthwhile.

"It's important for physicians to be aware of where their patients may have gone," said Frank concerning people who visit their practitioners complaining of problems related to Lyme disease. "If someone from Milwaukee just returned from Hayward the physician should consider this as a possibility."

Another disease carried by ticks receives less ink in the papers, but is just as dangerous to humans.

"Ehrlichiosis is not as well-known as Lyme disease, but it is a serious problem," said Belongia. "We've been studying it here at Marshfield. If you contract it, it often requires hospitalization. It occurs in the same areas as Lyme disease, primarily northwest Wisconsin where large numbers of ticks are found. We haven't been looking in southern portions of the state as much, but it wouldn't surprise me if there are cases down there that are diagnosed as something else.

"Symptoms can make it hard to pick up," added Belongia. "It's not as easy to diagnose as Lyme disease. It presents as a febrile illness with headache, muscle ache. Ehrlichiosis often causes blood abnormalities, like low platelet count and low white cell count, because the bacteria invades the white cells, the granulocytes. A lab test will pick it up, but of course you have to order the lab test to find out. Doctors need to have a high awareness of the possibility that a summer fever may be due to this, even if a patient doesn't recall a tick bite. The peak months are June and July. So a physician with a patient who has been in a high risk area in summer who presents with these symptoms should consider ehrlichiosis as a potential cause."

Even if a patient who presents with these symptoms lives in Racine or another urban area, Belongia urges physicians to dig a little deeper to see what the root cause of the fever may be.

"It doesn't do any harm to ask about vacations or trips to tick prone areas," he said, adding that for treatment, doxycycline works quite well. "But keep in mind that delaying treatment can lead to a worse outcome. People can get very ill from this disease, and some have died. High-risk people are generally those over 50. Children and young adults less frequently have severe problems with ehrlichiosis."

The US Centers for Disease Control and Prevention have established Web sites with information on various types of emerging infectious diseases, including Lyme disease, dengue fever, yellow fever, domestic aborviral encephalitides, plague, and Japanese encephalitis. Visit *http://www.cdc.gov/ncidod/index.htm.*

STDs and HIV

Sexually transmitted diseases, including HIV, fluctuate in incidence depending on the geographic location in the United States. While Hepatitis C virus (HCV) is linked to sexual behavior, its relationship to IV drug use and contaminated blood products appears stronger. In any event, the latency of presentation and uncertainty of numbers of those which HCV affects worries infectious disease experts (*see article on page 24*).

"Wisconsin is relatively less affected than other states," said Frank of sexually transmitted diseases (STDs), "compared to more populous urban areas such as San Francisco, Miami, New York. But we certainly continue to have problems. I personally have seen an upswing of new HIV infection. This may be due to complacency now based on our success in treating it. There may not be the same fear-factor for at-risk groups as there was a few years ago. There may also be some fatigue about the message. People have gotten complacent or tired of hearing about it and are engaging in risky behavior."

Physicians can have a significant impact on changing patient attitudes toward their behavior and how it relates to STDs.

"General practitioners have a crucial role for counseling and educating patients about safer sex," said Frank. "People don't come to see infectious disease specialists for these things. They see their family practitioner or primary providers, which gives these physicians the opportunity to counsel their patients, just as they would urge them to quit smoking and wear their seat belts.

This is particularly important regarding rapid diagnosis. The earlier these diseases are detected, the quicker the treatment, the better the outcome.

"If we can get it early, we have a chance," said Frank. "People with HIV may never get AIDS if they are treated early enough. There are volumes of evidence for this. General practitioners and ER physicians need to have a low threshold for testing, including all pregnant women they see. This will help in catching people early when treatments are most effective."

Tuberculosis

Twenty years ago, tuberculosis was just about eradicated, according to Frank. Its presence increased in recent years, however, in conjunction to the HIV epidem-

ic. And while it has leveled off, immigrants are at higher risk, as are the homeless, the incarcerated and the immuno-compromised.

"We don't see TB much, fortunately, but we have to keep the possibility in mind," said Frank, "especially in immuno-compromised people who can present in different ways. TB can occur in immigrants, particularly from Asia, where they are likely to have drug-resistant tuberculosis. In those countries, you can buy TB drugs over the counter. For example in the Philippines, antibiotics are used all the time as cough medicine. This favors development of drug resistance.

"Most countries outside of the US, Europe and Australia don't have prescription requirements, including Mexico and much of Latin America, where you can get over-the-counter medicines for TB," he added. In these countries, drug resistant TB is very common. So if TB resistant patients end up here, their disease can be very difficult to treat."

Specialists are guardedly optimistic concerning their ongoing battle with infectious diseases

"It's going to be a race between how quickly we develop new antimicrobials and how fast they develop resistance," said Frank. "We have to keep creating new antibiotics to keep a step ahead. But we also have to cut down on use of them as the diseases change. But no matter how well we regulate antibiotics, we will still need new ones.

"In the near future, I think antiviral drugs will be big. I can see it in HIV and in hepatitis C," Frank concluded. "Pharmaceuticals are already in trials for other viruses that cause meningitis, encephalitis, and common cold viruses. In the coming years we will see real advances. It's going to be very exciting."

Dangers of Antibiotic Overuse

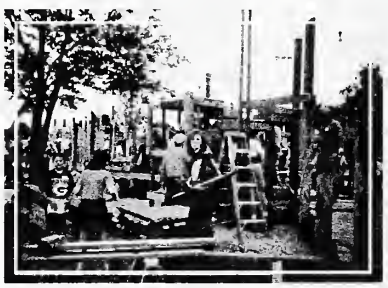
Continued from page 23

said Andes. "It's not in the United States, but countries that are sentinels for resistance, such as Spain and Southeast Asia. Some levels of resistance in areas of Asia are becoming alarming."

A team of University of Wisconsin-Madison researchers reported progress against resistance in an article in the April 6 edition of *Nature*. The article describes a new approach to treating resistant pathogens, including *Enterococcus faecium* and *Staphylococcus aureus*, using a synthetic beta-peptide to disrupt a bacterium's outer membrane.

"These things seem to be able to disrupt the bacterial membrane. When that happens, all hell breaks loose with the bacterium," commented UW-Madison chemistry professor Samuel H. Gellman, an author of the new study in a UW publication. "We don't think our new molecules will be compromised very quickly by resistance. These beta-peptides have no precedents in nature, unlike traditional antibiotics. Chemically, they are completely unlike the kinds of things bacteria typically see."

The *Nature* article reports low toxicity when exposed to human cells. The next step is to investigate how the synthetic beta-peptides perform in animal studies. If they prove as worthy at the bedside as they seem to do at the laboratory bench, such help could come none too soon for beleaguered clinicians who battle resistant pathogens. "We're just trying to keep a step ahead of the diseases as they mutate," Andes said. "It's just a matter of time before they do so. As they say, 'the bugs are smarter than we are.'



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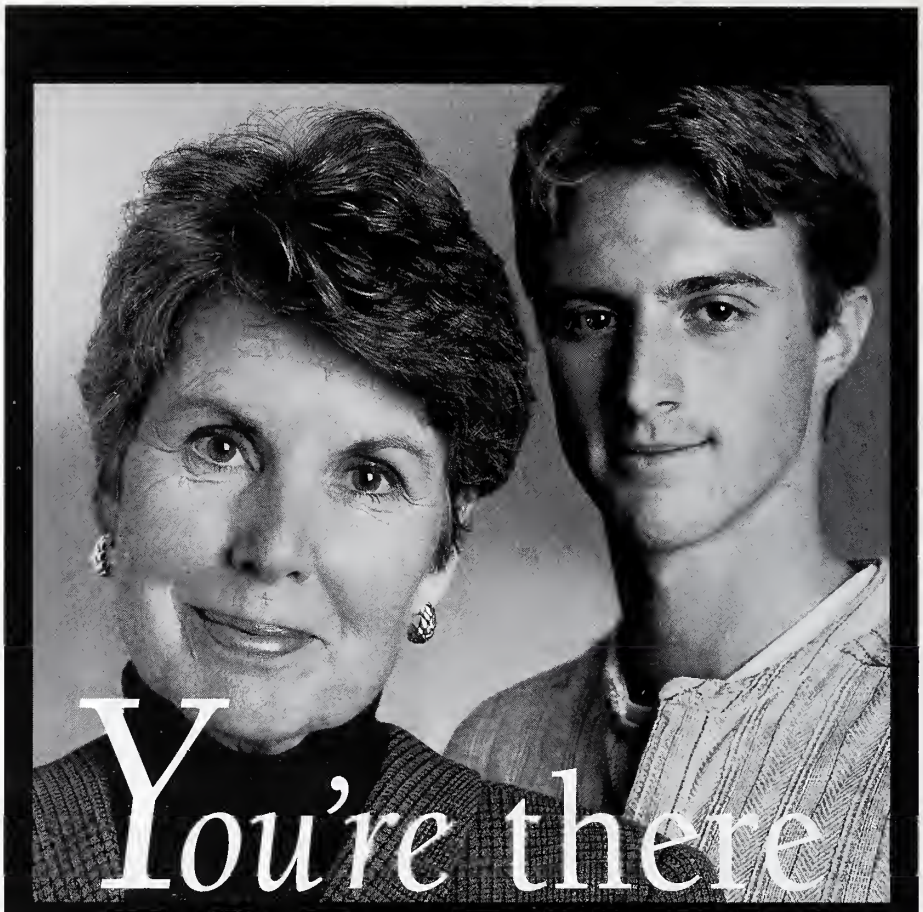

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Escherichia coli 0157:H7 Infections in Wisconsin, 1992–1999

Mary E. Proctor, PhD, MPH, and Jeffrey P. Davis, MD

ABSTRACT

Escherichia coli 0157:H7 infection became a reportable condition in Wisconsin on April 1, 2000; previously cases were voluntarily reported by physicians and laboratories. During 1992 through 1999, 1333 cases of *E. coli* 0157:H7 infection occurred in Wisconsin residents and were reported to the Wisconsin Division of Public Health. During this interval, the highest age-specific mean annual incidence, 13.2 cases per 100,000 population, occurred in persons 3 to 5 years old. Only 28% of patients with reported cases identified bloody diarrhea among their signs and symptoms. Of reported cases, 17% (231/1333) were involved in the eight outbreaks investigated during this interval. Among case patient identifiable risk exposures, farm related (13.4%), recreational water related (8.1%), and unpasteurized milk/dairy product (7.0%) exposures were the most frequently noted. Relatively few infections involved raw/undercooked ground beef consumption (5.8%). Recent use of pulsed-field gel electrophoresis has facilitated linkage of sporadically reported cases into recognized outbreaks. *E. coli* 0157:H7 infections frequently occur in Wisconsin; acquisition of these infections in a wide variety of settings poses important challenges to their prevention and control.

INTRODUCTION

In 1982, the investigation of two different outbreaks of a bloody diarrhea syndrome in the United States led to the identification of a new bacterial pathogen, *Escherichia coli* 0157:H7.[1] It was soon discovered that other *E. coli* serotypes shared a similar pathogenic potential; this group is called enterohemorrhagic *E. coli*, and *E. coli* 0157:H7 is the group's prototype.[2] In 1985-1986 *E. coli* 0157:H7 was associated with the occurrence of hemolytic uremic syndrome (HUS)[3] and thrombotic thrombocytopenie purpura (TTP).[4] In early 1993 the serotype 0157:H7 received considerable attention after a large foodborne disease outbreak was traced to the consumption of undercooked, contaminated hamburger served in a regional fast-food chain of restaurants. More than 700 persons in four states were infected, and 51 cases of HUS and four deaths were associated with this outbreak.[5]

Since 1993, the reported occurrence of serotype 0157:H7 *E. coli* infections has increased nationally, in part because of surveillance and increased awareness among physicians, clinical microbiologists, and consumers. The number of outbreaks or clusters reported to the Centers for Disease Control and Prevention (CDC) increased from 30 during 1993-1994 to 64 during 1997-1998.[6] *Escherichia coli* 0157:H7 infections are nationally notifiable and currently reportable in 49 states.

In Wisconsin, *E. coli* 0157:H7 infections, all five groups of pathogenic *E. coli* infections in humans, and HUS became reportable on April 1, 2000. The five groups of diarrhea producing pathogenic *E. coli* now reportable in Wisconsin are enterohemorrhagic *E. coli*, enterotoxigenic *E. coli*, enteropathogenic *E. coli*, enteroinvasive *E. coli*, and enteroaggregative *Exoli*. Each group of *E. coli* strains has a distinct group of somatic (O) and flagellar (H) antigens, specific virulence characteristics that typically are plasmid- mediated, and cause diarrheal illness with distinct clinical features.[2]

Because of the severe sequellae of infections caused by *E. coli* 0157:H7 and other Shiga-toxin-producing bacteria, public health follow-up and understanding and controlling the risk factors for acquiring these infections is important. Prior to April 1, 2000, *E. coli* 0157:H7 surveillance involved voluntary reporting by physicians and laboratories. Included in this report is a summary of the surveillance and epidemiologic features of *E. coli* 0157:H7 infections reported in Wisconsin during 1992-1999.

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METHODS

Reporting and case finding: On April 1, 2000 *E. coli* 0157:H7 infection became reportable in Wisconsin and is a category II condition reportable within 72 hours of diagnosis of a case or suspect case (Wisconsin Administrative Code, Department of Health and Family Services, Chapter HFS 145, Appendix A Communicable Diseases). The case definition for *E. coli* 0157:H7 is an infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps, which is laboratory confirmed by isolation of *E. coli* 0157:H7 from a specimen or by isolation of Shiga toxin-producing *E. coli* 0157:NM from a clinical specimen. Strains of *E. coli* 0157:H7 that have lost the "H" antigen become non-motile and are designated "NM". Prior to becoming officially reportable, physicians, laboratories, and local health departments (LHD) voluntarily reported *E. coli* 0157:H7 infection on the standard Wisconsin Division of Public Health (DPH) report form. Since 1993 an *E. coli* 0157:H7 follow-up report form has also been available to public health reporting sources in Wisconsin. This follow-up form requests information regarding clinical signs and symptoms, potential sources of infection, and risk factors for secondary transmission. The forms are typically completed by LHD staff. Data from DPH report and follow-up forms related to *E. coli* 0157:H7 infections were entered into a database in an ongoing manner. Potential clusters and outbreaks were investigated when an increase in case reports was identified which clustered by time, geographic location, or common risk exposure.

Laboratory identification: In addition to isolate identifications made in the Wisconsin State Laboratory of Hygiene (WSLH), laboratory identification of *E. coli* 0157:H7 occurred in at least 52 clinical microbiology laboratories throughout Wisconsin and in regional reference laboratories. Human isolates were identified as *E. coli* 0157:H7 if isolated as colorless colonies on MacConkey-sorbital agar (SMAC) media and were confirmed as 0157:H7 by agglutination of pure colony suspensions using specific O and H agglutination reagents. Since 1995, when epidemiologic information indicated potential exposures among case-patients, isolates were evaluated by pulsed-field gel electrophoresis (PFGE) to determine the degree of similarity in support of the epidemiologic evidence of a cluster or outbreak. PFGE analyses were conducted at the WSLH, the Minnesota Department of Health Laboratories, or the Centers for Disease Control and Prevention using previously described methods.[7] PFGE can link widely dispersed cases in different states and small clusters within states that might not previously have been recognized as related.

Figure 1. Annual age-specific incidence of *E. coli* 0157:H7 infection by gender, Wisconsin, 1992–199 (N=1333)

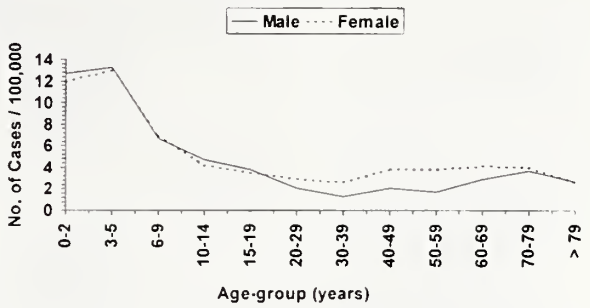
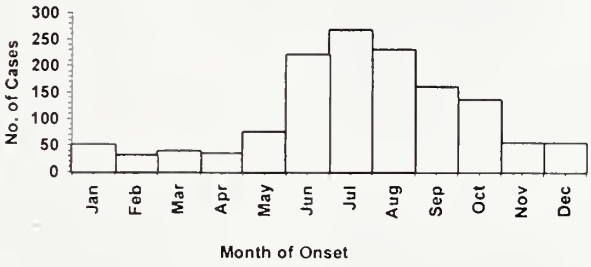


Figure 2. Seasonality of laboratory-confirmed *E. coli* 0157:H7 infection, Wisconsin, 1992–1999 (N=1333)



Data analysis: Data for cases of *E. coli* 0157:H7 infection reported to the DPH with onsets between January 1, 1992 through December 31, 1999 were analyzed using Epi-Info[8] (CDC, version 6) to describe the demographic, clinical features, and risk factor profile of *E. coli* 0157:H7 cases in Wisconsin. Annual incidence rates were calculated using Wisconsin 1996 estimated census data. Additional information on potential risk factors (e.g., consumption of unpasteurized milk, contact of a previous case in a daycare setting) was determined through a review of case follow-up forms.

RESULTS

Demographics: Reported *E. coli* 0157:H7 infections have increased annually in Wisconsin from 39 cases in 1992 to 232 cases in 1999; 1333 cases were reported during the eight year study period. Cases were reported in all of Wisconsin's 72 counties. Among the 1333 cases, 56% occurred in females; 52% (693/1333) of cases occurred in individuals less than 20 years of age and 38% (507/1333) of all reported cases occurred in children less than 10 years of age. Annualized age-specific incidence (Figure 1) was highest among males and females less than 6 years of age with peak annual rates of 13.3 and 13.0/100,000 in 3 to 5-year-

Table 1. Most probable risk exposures for Wisconsin case-patients with *E. coli* 0157:H7 infection for whom a follow-up form was completed, 1996–1999

Risk factor or risk exposure	Number (%) individuals who listed this risk factor n = 994
Unknown	479 (48.2%)
Farm related (Total)	133 (13.4%)
Farm visit	80 (8.1%)
Live on farm	34 (3.4%)
Animal manure exposure	19 (1.9%)
Recreational water exposure (Total)	81 (8.1 %)
Lake/river/stream	61 (6.1 %)
Swimming pool (under chlorinated)	18 (1.8%)
Water park	2 (0.2%)
Unpasteurized milk/dairy	70 (7%)
Raw/undercooked ground beef (Total)	58 (5.8%)
Consumed at home or friend's	46 (4.6%)
Consumed at restaurant	12 (1.2%)
Household (person-to-person)	57 (5.7%)
Other miscellaneous	43 (4.3%)
Daycare related	16 (1.6%)
Travel domestic (out of state or county)	31 (3.1%)
Travel out of U.S.	14 (1.4%)
Well water contaminated	9 (0.9%)
Unpasteurized apple juice	3 (0.3%)

old males and females, respectively. The incidence rates were less than 4.1/100,000 for all age groups over 19 years of age. Annual age-specific incidence rates were higher for females than males for all ages over 19 years and likely reflects increased involvement of females with childcare-related activities. Reported cases occurred during all months of the year but were most frequent during the summer and fall months, with a peak in July (Figure 2).

A follow-up form with data regarding clinical signs and symptoms and potential exposure risk factors during the two week period immediately preceding onset of signs and symptoms was submitted for 994 (75%) of reported cases. Among cases, diarrhea (99%) and abdominal cramps (54%) were the most frequently reported signs and symptoms; bloody diarrhea was reported in only 28% of cases. Fever (29%), nausea (21%), and vomiting (20%) were less commonly observed. Loss of appetite (mean 10 days) and fatigue (mean 9.4 days) were the symptoms with the longest duration. Among all 1333 case-patients, 440 (33%) were hospitalized, 63 (4.7%) developed HUS, seven (0.5%) developed thrombotic thrombocytopenic purpura (TTP), and eight (0.5%) case-patients died.

Probable risk exposures: Among the 994 case-reports with information on potential exposure risk factors, the most probable risk exposure was unknown or data were insufficient to assign a probable source in 48.2% of cases. The data suggest that acquisition of *E. coli* 0157:H7 infection in Wisconsin may occur by a variety of mechanisms more common than consumption of undercooked ground beef (Table 1). Among those with identifiable risk exposures, farm related (13.4%), recreational water related (8.1%) and consumption of unpasteurized milk/dairy (7.0%) were the most frequently noted probable sources of infection. In aggregate, consumption of raw ground beef either at home, a friend's home, or a restaurant accounted for fewer than 6% of risk exposures. Likely exposures involving travel out of the country, attending child daycare, and consumption of contaminated well water were each noted in fewer than 2% of cases.

Wisconsin E. coli 0157:117 outbreak investigations: The Communicable Disease Epidemiology Section (CDES), DPH investigated eight outbreaks of *E. coli* 0157:H7 infection during 1992-1999 (Table 2). One was a child daycare center associated outbreak,[9] two were recreational waterborne outbreaks (WBOs), and five were foodborne outbreaks (FBOs). The settings for the five FBOs included church festivals (2), a submarine sandwich shop, three private gatherings with a common caterer, and a community outbreak originating at a dairy plant. In aggregate these eight outbreaks involved 231 case-patients and represented 17% of all *E. coli* 0157:H7 infections reported during 1992-1999; 62 (27%) of outbreak-related case-patients were hospitalized including five (2.2%) with HUS. No deaths were associated with these outbreaks. Presenting symptoms were not significantly different for these outbreak-related cases than for sporadic cases of *E. coli* 0157:H7 except that a higher percentage of outbreak-related case-patients reported bloody diarrhea (61%) than did all case-patients with follow-up forms in aggregate (28%). In addition, the occurrence of HUS and TTP among the outbreak-related cases was lower than in sporadically reported cases (65/1102, 5.9%).

Point source outbreaks provide information regarding incubation period of *E. coli* 0157:H7 infection which sporadic cases generally cannot provide. The mean incubation period was 103 hours (range, 60 to 132 hours) for the two WBOs and 89 hours (range, 26 to 193 hours) for the five FBOs. The mean incubation period for the daycare center outbreak could not be determined as it was a non-point source outbreak. The mode of transmission was direct person to person in the daycare center outbreak. Indirect person-to-person transmission of *E. coli* 0157:H7 via fecal

Table 2. *E. coli* 0157:H7 outbreaks investigated in Wisconsin during 1992 through 1999

Month/year of outbreak	Type of outbreak	Outbreak setting	No. ill	No. hosp.	No. HUSO	No. died	Mean incu. period (hrs)	Comments
Oct 1994	FBO*	submarine sandwich shop	26	6	0	0	72 (24–216)	Lettuce contaminated by infected food handler
July 1994	person-to person	child daycare	43	0	0	0	undetermined (not a point source outbreak)	Transmission among 11–62-month old-children who shed 0157: H7 up to 39 days after symptoms began and up to 23 days after symptoms ceased.
June 1995	WBO*	shallow wading beach	14	3	3	0	135 (72–168)	Shallow water point source exposure from child fecal accident or farm runoff; minimum water turnover.
Aug 1995	FBO	church festival	27	8	0	0	103 (24–216)	Ice disks used to cool water were handled with bare hands. Cross contamination in food prep area where meat was prepared and water containers filled.
June 1998	FBO	community graduation	55	25	1	0	90 (24–192)	Pasteurized and unpasteurized cheese curds produced on same day on same production line; multiple points for cross contamination.
June 1998	FBO	community	47	10	1	0	85 (11–230)	Fruit salad implicated. Fruit probably inadequately washed.
Nov 1998	FBO	community church potluck	14	3	0	0	96 (48–114)	Multiple foods associated with illness. Three PFGE patterns identified.
Aug 1999	WBO	public beach at small lake	5	5	0	0	72 (48–96)	Fecal accident; low water turnover.

*FBO = Foodborne outbreak; WBO = Waterborne outbreak
HUS = Hemolytic uremic syndrome

contamination of shallow water by an infected child likely caused the two WBOs (Table 2). Food vehicles implicated in the five FBOs included water or ice disks, lettuce, unpasteurized cheese curds, fresh fruit, and one outbreak involving multiple foods.

Likely points of contamination in these outbreaks are noted in Table 2.

DISCUSSION

Although *E. coli* 0157:H7 infection was not officially reportable in Wisconsin prior to April 1, 2000, the annual number of voluntarily reported cases in Wisconsin exceeded the annual number of cases in many states where it is reportable.[10] Data in this report summarizes demographic and risk exposure information for *E. coli* 0157:H7 infection in Wisconsin during eight years of voluntary reporting will facilitate future evaluation of the impacts of mandatory reporting.

Although nationally 3161 cases of *E. coli* 0157:H7 infections were reported to CDC in 1998,[10] the estimated annual *E. coli* 0157:H7-related morbidity and mortality in the United States includes 73,000 cases, 2100 hospitalizations, and 61 deaths (CDC internet web site *http://www.cdc.gov/ncidod/dbmd/diseaseinfo/escherichiacoli_t.htm* last reviewed April 4, 2000). The CDC has compiled data on nationally reported *E.*

coli 0157:H7 outbreaks that occurred in 1995-1998; 20% of outbreak-related cases were hospitalized, 4% developed HUS, and 0.4% died.[6] While the national rates of occurrence of HUS and death following *E. coli* 0157:H7 infection were similar to those reported in Wisconsin, the hospitalization rate was less than the rates among Wisconsin outbreak-related and sporadic cases. This may indicate that the more severely ill, apparently sporadically occurring cases, are more likely to be voluntarily reported. In addition, case ascertainment is enhanced during outbreak investigations which can result in detection of a larger portion of the milder illnesses. The number of case reports will likely increase with mandatory reporting and may include a greater proportion with less severe clinical presentations which may result in lower reported rates of *E. coli* 0157:H7 related hospitalization, HUS/TTP and mortality.

The low rate of occurrence of *E. coli* 0157:H7-related bloody diarrhea (28%) is not unprecedented in Wisconsin. In 1988, in an outbreak of *E. coli* 0157:H7 infection associated with undercooked roast beef served during a banquet at a university, the occurrence of bloody diarrhea was 39% among 61 cases.[11] Indexes of suspicion for *E. coli* 0157:H7 infections should be enhanced. Clinicians should consider *E. coli* 0157:H7 infection in their differential diagnoses in patients with three or more days of diarrhea accompanied by cramps regardless of whether there is visible blood in the stool. Loss of appetite and fatigue lasting more than a week may also be useful in suspecting *E. coli* 0157:H7 infection. Selection of appropriate laboratory media should accompany heightened awareness of these infections. *E. coli* 0157:H7 organisms are not detectable on the usual plating media containing lactose used to isolate and identify traditional bacterial enteric pathogens.[12]

Since the first outbreaks of *E. coli* 0157:H7 were traced to ground beef, isolation of this organism from dairy cattle has been documented with an isolation rate of 1% or less and generally higher rates of up to 5 percent in heifers and calves.[13,14] Recent studies in Wisconsin [15] and elsewhere[16] have documented the role of drinking water and horizontal transmission for sustained transmission of this pathogen among cattle in the farm setting. Although *E. coli* 0157:117 can colonize many other animal species, the fact that human outbreaks have not been traced to foods made from animals other than cattle, with the exception of turkeys[17] and venison,[18] suggests that colonization of other food animals with Shiga-like toxin-producing *E. coli* pathogens is low or that slaughter and processing techniques limit contamination of food produced from those animals.

Among outbreaks reported to CDC and occurring in 1995-1998, the majority occurred during May to October and a peak of 24% of the outbreaks occurred in July.[6] This parallels the seasonality of laboratory-confirmed *E. coli* 0157:H7 infection in Wisconsin. Seven of Wisconsin's eight recent outbreaks occurred between June and October and five occurred in June to August. Bovine fecal shedding of *E. coli* 0157:H7 is most common in warm weather[19] which is consistent with outbreaks reported in the United States[1,11] and in Wisconsin. Because fewer than 10 organisms can cause illness with *E. coli* 0157:H7, small numbers of bacteria in food vehicles or in fecally contaminated water (from a fecal accident or barnyard runoff) have a chance to amplify under warm summer conditions. The occurrence of the highest incidence rates in Wisconsin among children less than 6 years old may be explained in part by daycare exposure in this age group, less developed personal hygiene (especially handwashing), and the tendency to swallow water in recreational water settings in this age group.[20]

Wisconsin outbreak data for the period 1992-1999 is similar to national outbreak data. Although the initial recognition and heightening of awareness of *E. coli* 0157:H7 involved restaurants outbreaks, only 12% (1/8) of Wisconsin and 8% (10/125) of nationally-reported *E. coli* 0157:H7 outbreaks were restaurant associated.[6] National and Wisconsin outbreaks were more likely to be related to community events such as fairs, festivals, catered events and camp groups. Roughly 75% of 125 outbreaks of *E. coli* 0157:H7 infection reported to CDC during 1995-1998 were categorized as occurring in home settings (21%), the general community (18%), group events such as fairs, weddings, catered events (23%), restaurants (8%) and institutions (6%) such as prisons, military bases, nursing homes and typically involved contaminated food items or water (well or other). Contaminated food items noted included undercooked ground beef, unpasteurized apple juice and apple cider, inadequately washed lettuce, alfalfa sprouts, milk, unpasteurized cheese curds, and home prepared venison jerky among others. Outbreaks occurring in child day care settings (16%) involved person-to-person transmission or transmission in wading pools. Other outbreaks were recreational water-related in river, lake and pool settings (8%).[6]

CONCLUSION

E. coli 0157 infections frequently occur in Wisconsin. The acquisition of these infections in a wide variety of settings poses challenges to their prevention and control. However, important recommendations to prevent *E. coli* 0157:H7 infection have been widely

disseminated by CDC and other agencies. These include:

- Cook all ground beef and hamburger thoroughly;
- Send back undercooked hamburger or other ground beef product for further cooking when in restaurant settings;
- Adhere to careful food preparation practices in kitchen settings (home or food service);
- Wash fruits and vegetables carefully, especially those that will not be cooked;
- Drink only pasteurized milk, juice, or cider;
- Drink municipal water that has been treated with chlorine or other effective disinfectants;
- Avoid swallowing lake or pool water while swimming;
- Anyone with a diarrheal illness should avoid swimming in public pools or lakes, sharing baths with others, and preparing food for others;
- Insure that persons with diarrhea, especially children, wash their hands carefully with soap after bowel movements;
- Wash hands after changing soiled diapers;
- Wash hands after contact with cattle and cattle fecal material including manure used for farming or domestic gardening practices.

The prompt reporting to local health departments and DPH of *E. coli* 0157:H7 infections, any diarrhea producing *E. coli* infection and HUS by clinicians and laboratories in Wisconsin and the molecular subtyping of pathogenic E. *coli* will facilitate outbreak recognition and greater understanding of risk factors for their acquisition and timely opportunities for their prevention. Readily accessible information on these and many other conditions can be found in CDC (*http://www.cdc.go*) and Wisconsin Department of Health and Family Services (*http://www.dhfs.state.wi.usn*) internet Web sites.

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HIV Infection in Wisconsin: An Overview of Epidemiologic Trends, 1983–1999

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ABSTRACT

A review of HIV case surveillance data shows that the number of persons reported with HIV infection in Wisconsin steadily increased during the 1980s, leveled in the early 1990s and since 1993 has tended to decline. Cases reported in 1999 represented a 44% decrease compared to the 1990-1993 average. The number of deaths among persons with HIV infection declined 64% from 1993 to 1999; as a result, the number of persons living with HIV infection nearly doubled during the 1990s. Comparing cases reported 1995-1999 with cases reported in the 1980s, a higher percentage was attributed to injection drug use and high-risk heterosexual contact. A higher percentage of HIV cases also occurred among females and racial and ethnic minorities.

INTRODUCTION

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) are significant causes of illness, disability, and death in the United States.[1] The federal Centers for Disease Control and Prevention (CDC) estimates that 650,000 to 900,000 persons infected with HIV are living in the United States and that approximately 30% are unaware of their infection.[2,3] Now near the end of its second decade, the HIV epidemic continues to be a major public health problem in Wisconsin. With more Wisconsin residents living with HIV infection than ever, clinicians have a critically important public health role in reducing HIV transmission.

METHODS

Wisconsin statute requires confidential, name- associated reporting of confirmed HIV infection and AIDS to the State Epidemiologist. Cases are reported to the Wisconsin AIDS/HIV Program from health care providers and laboratories conducting HIV testing. In addition, the HIV Surveillance Unit engages in a variety of active case-finding activities with private physicians, hospitals, clinics, laboratories and other sources. AIDS/HIV surveillance data collected in Wisconsin is transmitted to the CDC without names or personal identifying information for inclusion in national statistics.

In this report, the term "HIV infection" means all cases of laboratory-confirmed HIV infection including cases which meet the CDC AIDS case definition.[4] This report reviews the epidemiology of HIV infection in Wisconsin utilizing AIDS/HIV case surveillance data collected through December 31, 1999. AIDS cases first became reportable in Wisconsin in 1982; HIV infection cases have been reportable since 1985.

RESULTS

Through December 31, 1999, 6856 persons with HIV infection have been reported in Wisconsin. This includes 4326 persons who have met the CDC criteria for AIDS. A total of 2575 persons reported with HIV infection in Wisconsin have died. Between 1990 and 1999, 5371 new cases of HIV infection were reported, 78% of the total.

The number of reported cases of HIV infection in Wisconsin increased throughout the 1980s (Figure 1). Between 1990 and 1993 case reports leveled; an average of 667 new cases (range: 650-686) were reported each year. Since 1993, the number of new cases reported annually has tended to decline. In 1999, 375 cases of HIV infection were reported, a 44% decrease in newly reported cases compared to the 1990-1993 average.

The number of known deaths among persons reported with HIV infection in Wisconsin has also declined (Figure 1). In 1998, 120 deaths occurred—a 64% decline compared to the 335 deaths in 1993. Declining death rates have resulted in an increase in the number of living persons with HIV infection (Figure 2). In 1999, the number of reported persons living with HIV infection was nearly twice the number in 1990.

The majority of AIDS cases reported in Wisconsin have been among men who have sex with men (MSM). In recent years, however, the percentage of cases attributed to MSM has declined (Figure 3). Prior to

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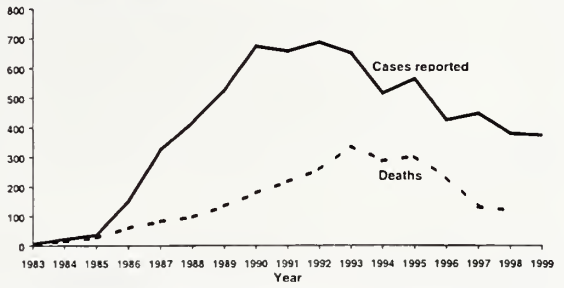
1990, 82% of AIDS cases were among MSM; this percentage was 62% between 1995 and 1999. Conversely, the percentages of cases attributed to injection drug use (IDU) and heterosexual contact with a high-risk partner have increased. Prior to 1990, 6% of AIDS cases were attributed to injection drug use and 3% to high-risk heterosexual contact. Between 1995 and 1999, these percentages were 18% and 11% respectively.

In addition to changes in the risk exposure of reported cases, there have also been several important demographic shifts. Although males continue to constitute a majority of cases, the percentage of cases reported among females has increased over time (Table 1). Prior to 1990, 10% of reported cases of HIV infection were among females; among cases reported from 1995-1999, 18% have been among females.

Throughout the epidemic, racial/ethnic minority populations in Wisconsin have been disproportionately affected by HIV infection. Although only 10% of the Wisconsin population are minority, the percentage of cases reported among minorities increased from 33% prior to 1990, to 48% between 1995 and 1999 (Table 1). In 1999, for the first time, more than half (52%) of all cases of HIV infection reported in a single year were among racial/ethnic minorities. Between 1995 and 1999, the average annual reported incidence of HIV infection was thirteen-fold greater for African Americans (65 per 100,000) and six-fold greater for Hispanics (30 per 100,000) compared to the rate among whites (5 per 100,000).

It should be noted that the increasing percentage of HIV infection cases reported among racial/ethnic minorities is not due to an increase in the absolute number of cases reported. In recent years the number of cases reported among African Americans and Hispanics has actually been lower than earlier in the 1990s (Figure 4). The decline in case numbers has, however, been greatest among whites. Since 1993, 75% of the overall decrease in reported HIV infection in Wisconsin has been among whites. Therefore, the underlying reason behind the increasing minority percentage is the uneven rate of decline in cases.

Figure 1. Number of persons reported with HIV infection, by year of report 1983–1999 and number of deaths* among persons reported with HIV infection, by year of death 1983–1998, Wisconsin



*Due to delays in reporting of deaths, an accurate estimate of total deaths in 1999 is not yet available.

Figure 2. Number of persons reported with HIV infection who were assumed alive at mid-year, 1983–1999, Wisconsin

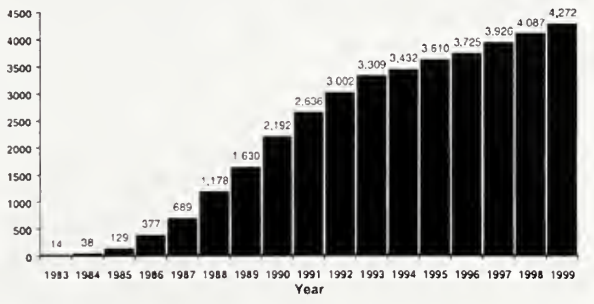
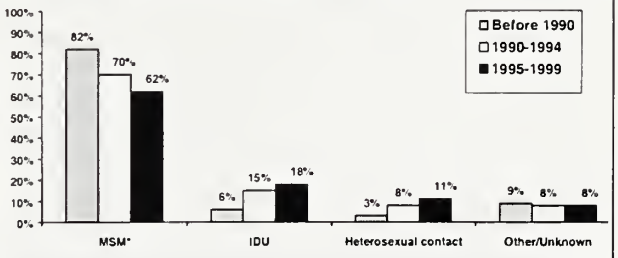


Figure 3. Comparison of exposure category distribution for AIDS cases reported during three time periods (before 1990, 1990–1994, and 1995–1999), Wisconsin



Including men who have sex with men and also inject drugs.

DISCUSSION

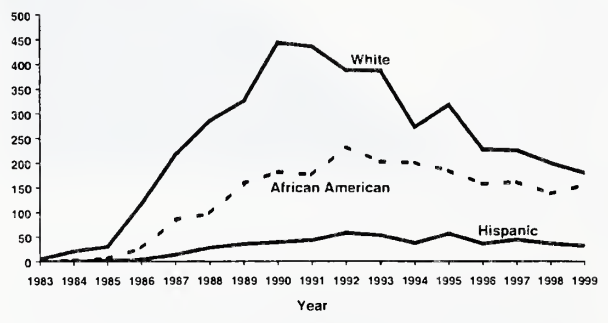
After the first six cases of HIV infection in Wisconsin were reported in 1983, annual case reports in Wisconsin steadily increased throughout the 1980s. The unrelenting increase in reported cases experienced during the 1980s was understandably a cause for great concern. Indeed, a 1990 analysis by the Wisconsin AIDS/HIV Program suggested that if trends continued as they had in the 1980s, 11,000 new cases of HIV infection could be expected in the 1990s.[5]

The 1990s, however, proved to be a pivotal decade in the epidemic of HIV infection in Wisconsin. Early in the 1990s reported cases leveled and thereafter began to decline. By 1999, the annual number of reported cases of HIV infection was 44% below the number early in the decade. In fact, between 1990 and 1999, less than half of the predicted number of cases was reported. The 1990 predictions did not materialize, at least in part because of an unprecedented effort by many groups and individuals to prevent the transmis-

Table 1. Reported HIV infection by sex and race/ethnicity for three time periods in Wisconsin by year of first report

	1983–1989		1990–1994		1995–1999		Cumulative	
	N	%	N	%	N	%	N	%
Total	1485	100%	3181	100%	2190	100%	6856	100%
Sex								
Males	1339	90%	2728	86%	1792	82%	5859	86%
Females	146	10%	453	14%	398	18%	997	14%
Racelethnicity								
White	1000	67%	1923	60%	1147	52%	4070	59%
African American	376	25%	991	31%	795	36%	2162	32%
Hispanic	82	6%	230	7%	204	9%	516	8%
Asian/Pacific Islander	8	<1%	8	<1%	13	<1%	29	<1
American Indian	9	<1%	29	1%	26	1%	64	1
Unknown	10	<1%	0	0%	5	<1%	15	<1%

Figure 4. HIV infections by race/ethnicity and year of report, Wisconsin, cases reported through December 31, 1999



sion of HIV. It is clear that these prevention efforts have had significant success.

While progress has been made, there is no room for complacency in efforts to combat HIV infection and AIDS. HIV infection rates among African Americans and Hispanics in Wisconsin are unacceptably high and represent a significant health disparity. HIV prevention efforts, while showing signs of success among the white population, have not been as successful among racial and ethnic minorities. The challenge for the future is to expand the benefits of HIV prevention to the entire Wisconsin population.

Early diagnosis of persons with HIV infection plays a vital role in minimizing HIV transmission and will remain a public health priority as the HIV epidemic enters the 21st century. Early diagnosis is a prerequisite to receipt of appropriate care and treatment that can help infected persons stay healthy longer. In addition, persons diagnosed with HIV infection can be linked to services that can help them avoid transmitting HIV infection to others. Clinicians can play a major public health role by talking proactively to patients about HIV infection, offering HIV testing as needed (including all pregnant women), and reinforcing the importance of preventing the further transmission of HIV by patients already infected.[6,7]

Additional Wisconsin HIV epidemiologic data and analysis are available on the Wisconsin Department of Health and Family Services Internet web site at *http://www.dhfs.state.wi.us/aids-hiv/index.htm.*

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Wisconsin, July 1999 Heat Wave: An Epidemiologic Assessment

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ABSTRACT

Objective: To assess the characteristics of heat-related deaths in Wisconsin during the summer of 1999.

Methods: Review of death certificates indicating heat as an underlying or contributing cause of death.

Results: Heat-related illness led to 21 deaths during the summer of 1999 in Wisconsin. The rate of death was highest in the elderly, particularly those aged 65-84 years (2.2/100,000). Heat was the underlying cause for 12 of the 21 deaths. Cardiovascular conditions were the underlying cause in 8 of the deaths, and a contributing cause for another 7.

Conclusions: The elderly, persons taking psychotropic medications, and persons with chronic diseases, particularly cardiovascular conditions, are at increased risk of death from heat during heat waves. Prevention messages and weather advisories during heat emergencies must target these groups. Care givers and medical personnel must be on heightened awareness for the signs and symptoms of heat exhaustion and heat stroke during these periods.

INTRODUCTION

From 1979 through 1997, an average of 371 Americans per year died from excessive heat, more than from earthquakes, lightning, hurricanes, tornadoes and floods combined.[1] During heat waves, the death toll can increase significantly. Wisconsin is not immune to this problem. From 1979 through 1997, Wisconsin had an average of 6.6 deaths from excessive heat per year. However, during the heat wave of 1995, 81 persons died of excessive heat, and heat was a contributing cause of death for 73 additional persons.[2] Ninety-one of these 154 heat-related deaths were in Milwaukee County alone. In response, the City of Milwaukee Health Department implemented a new Extreme Heat Plan[3] that promotes preventive action by health providers, community organizations and county residents before and during heat waves and mobilizes a coordinated response for declared heat emergencies.

During July 1999, a heat wave occurred over south-central and southeast Wisconsin, resulting in the deaths of 21 Wisconsin residents from hyperthermia or environmental heat stress.[4] The National Weather Service issued heat advisories for July 3-4, 23-24, and 29-30 in 21 different counties. During these periods, maximum heat indices ranged from 102°F to 125°F. In this report, we describe characteristics of these 21 heat-related deaths.

METHODS

We reviewed Wisconsin death certificates to identify hyperthermia or environmental heat stress as an underlying (primary) or contributing (secondary) cause of death. We obtained data on age, race, gender, drug use, whether the body was found more than 24 hours following death, place of death, and county of death. Confidence intervals for rates were determined using Poisson statistics. Because 1999 population estimates were not yet available, mortality rates and relative risks for different categories were determined by using US Census Bureau 1998 population estimates for Wisconsin.

Heat levels are reported using the heat index, which is a measure that combines air temperature and humidity to better reflect how hot it feels. The heat index is often referred to as the "apparent temperature" and is analogous to the wind chill factor for cold temperature.

RESULTS

Hyperthermia or environmental heat stress was listed as the underlying cause in 12 of the 21 heat-related deaths (57%) and the contributing cause in 9 deaths (43%). Heat indices peaked (110-125°F) throughout Wisconsin on July 29-30, and a majority of the heat deaths occurred during the 3-day period between July 29 and 31 (Figure 1). Among the 13 deaths that oc-

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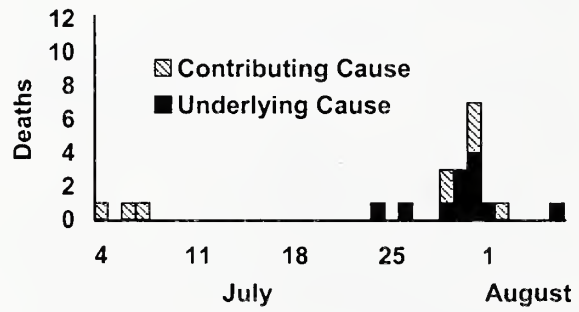
Table 1. Characteristics of Decedents from Excessive Heat in Wisconsin in 1999

Group	Number	Rate (per 100,000)[1]
Age (years)		
<20	0	0
20-44	0	0
45-64	7	0.63
65-84	13	2.20
>85	1	1.10
Gender		
Male	14	0.54
Female	7	0.26
Race		
White	19	0.37
Black	2	0.69
County		
Milwaukee	11	1.15
Other Counties[2]	10	0.71
TOTAL	**21**	**0.40**

[1]Rates for numbers less than 20 are unreliable.
[2]Includes: Calumet, Crawford, Dane, Fond du Lac, Manitowoc, Racine, Waukesha, Winnebago and Wood Counties

Figure 1. Heat-related deaths, Wisconsin, 1999. The dates indicated are Sundays



curred over this 3-day period, hyperthermia or environmental heat stress was the underlying cause of death for 8 (62%), and the underlying causes for the other 5 (38%) were cardiovascular conditions.

The rate of heat-related death was greatest among persons aged 65-84 years (2.2/100,000), followed by those aged 85 years and older (1.1/100,000) (Table 1). Persons under the age of 65 years had a lower risk of dying from heat-related causes (0.63/100,000) than older adults, with the youngest to succumb being aged 45 years. The death rate was higher among males than females (0.54/100,000 compared with 0.26/100,000; RR=2.07, 95%CI 0.84-5.13), and in blacks than whites (0.69/100,000 compared to 0.40/100,000; RR=1.74, 95%CI 0.41-7.48).

Among the 12 deaths with hyperthermia or environmental heat stress reported as the underlying cause, seven had a cardiovascular condition cited as a contributing cause of death (Table 2). The remaining heat deaths had emphysema, alcoholism, cirrhosis of the liver, diabetes, and mental illness (including use of psychotropic medication) cited as contributing causes. Of the 9 deaths for which the underlying cause was not hyperthermia or environmental heat stress, 8 had a cardiovascular condition (dilated cardiomyopathy, arteriosclerosis, myocardial infarction, and hypertension) cited, and 1 had chronic obstructive pulmonary disease (COPD) cited. Thus, cardiovascular conditions contributed to death in 71% (15/21) of the heat-related deaths. Among the 8 deaths resulting from cardiovascular conditions, only 2 had a contributing cause in addition to heat (COPD and schizophrenia). The single death with COPD as the underlying cause cited only heat as a contributing cause.

Factors that decrease the risk of heat-related death include social interaction and having and using an air-conditioner. Factors that increase the risk include physical activity and use of psychotropic medications and alcohol.[5-7] Limited information on all but the last two risk factors was available through death certificates.Mental illness was cited in 4 (19%) of the 21 heat-related deaths as a contributing factor, and 3 of these 4 deaths mentioned use of psychotropic medications by the victims. Of these 3 deaths, 2 had hyperthermia or environmental heat stress listed as the underlying cause of death, and 1 had hyperthermia or environmental heat stress listed as a co-contributing cause with dilated cardiomyopathy as the underlying cause. In all deaths where psychotropic medications were mentioned as a contributing factor, the victims were under the age of 55 years (47, 47, and 54) and male. In addition, 2 were white and the other was black. Alcohol use and/or alcoholism was cited as a contributing cause in 2 (10%) of the 21 heat-related deaths. In both of these deaths, hyperthermia or environmental heat stress was given as the underlying cause of death. Of 20 deaths for which we could obtain 1990 census data for the ZIP code of the residence, 12 (60%) occurred in ZIP codes where 30% or more of the population had incomes below 185% of poverty.

Four (19%) of the 21 persons who died of heat-related causes were not found within 24 hours of death. Of these 4 persons, two had hyperthermia or environmental heat stress cited as the underlying cause of death, and the other 2 had dilated cardiomyopathy given as the underlying cause. In addition, 19 of the 21

(90%) heat-related deaths occurred in the victims' residences, and the other 2 deaths occurred in institutional settings.

Eleven of the 21 (52%) heat-related deaths occurred in Milwaukee County, which contains an estimated 18-20% of the total population of Wisconsin and 17% of the Wisconsin population over 45 years of age. Eight of the Milwaukee County deaths occurred in the city of Milwaukee, and 1 death each occurred in West Allis, West Milwaukee and South Milwaukee. Hyperthermia or environmental heat stress was cited as the underlying cause in 4 (36%) and contributing cause in 7 (64%) of the 11 heat-related deaths in Milwaukee County. Cardiovascular conditions were cited as the underlying cause in 7 of the 11 (64%) deaths and as the contributing cause in 1 death. Other contributing causes of death for Milwaukee County included mental illness with psychotropic medication use, alcoholism and emphysema.

Ten of the 21 (48%) heat-related deaths occurred outside Milwaukee County: 2 in Crawford County and 1 each in Calumet, Dane, Fond du Lac, Manitowoc, Racine, Waukesha, Winnebago and Wood counties. These counties accounted for 48% of all heat-related deaths recorded during that period in the state and contain approximately 27% of the population of Wisconsin and 26% of the state's population over the age of 45 years. In all but 1 of these counties, hyperthermia or environmental heat stress was listed as the underlying causes of death; in the other county, COPD was listed. Contributing cause of death for these cases included cardiovascular conditions, mental illness with psychotropic drug use, cirrhosis of the liver and emphysema.

Table 2. Underlying and contributing causes of death associated with 21 heat-related deaths, Wisconsin, July 1999

Underlying Cause	Contributing Causes (other than heat)
Heat	• Myocardial infarction, and congestive heart failure and Hypertension • Heart disease • Cardiac arrhythmia and psychiatric disorder • Cardiomyopathy and cirrhosis of liver • Hypertension and history of cerebrovascular accident • Hypertension, arteriosclerosis and diabetes • Hypertension and cerebrovascular accident • Emphysema and chronic bronchitis • Acute and chronic alcoholism • Urosepsis and emphysema • Seizure and mental illness • Mental illness
Cardiovascular (Cardiomyopathy)	• Congestive heart failure and chronic obstructive pulmonary disorder • Congestive heart failure • Schizophrenia
Cardiovascular (Arteriosclerosis)	• None (3 deaths)
Cardiovascular (Myocardial infarction)	• None
Cardiovascular (Hypertensive Cardiovascular Disease)	• Right shoulder fracture
Chronic Obstructive (Pulmonary Disorder)	• None

DISCUSSION

The 21 heat-related deaths during the July 1999 heat wave were significantly greater than the 2 to 7 deaths per year reported in 1991–1997 (excluding 1995)-years without major heat waves (1999 rate=0.38/100,000 and 1991-1997 rate=0.01/100,000; RR=4.7, 95% CI 2.7-8.4). The 1999 heat death rate, however, was small in comparison with the 3.0/100,000 rate seen during the Wisconsin heat wave in the summer of 1995 (RR=0.13, 95% CI 0.08-0.21). In 1999, heat-related deaths were concentrated over a 3-day period as in 1995, representing 62% (13/21) of total deaths compared with 64% (98/154) in 1995. The maximum heat indices in both years ranged from 110°F to 125°F.

The largest percentage of deaths in both 1995 and 1999 occurred in Milwaukee County. Aside from the larger population in this county, the increased heat-related deaths might reflect the tendency of urban areas to produce and retain more heat than rural areas (the "heat island effect"[8]) as well as higher rates of socioeconomic risk factors for heat-related death.[5,6] However, 1999 heat-related mortality rates in Milwaukee County were lower than those for 1995, and preliminary analyses indicate that this difference could not be entirely attributed to differences in temperature[9]. Additional investigation is under way to precisely assess the contribution of temperature patterns to the reduced death rate in 1999. We believe the proactive planning in the Milwaukee Health Department's Extreme Heat Plan, a state heat advisory by the Wisconsin Department of Health and Family Services, as well as early and frequent press appearances featuring Milwaukee's mayor and health officer, all contributed to reducing the burden of heat-related mortality in 1999.[9]

Signs and Symptoms of Heat-related Illness

Heat Exhaustion

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

What to do: If symptoms are severe or the victim has heart problems or high blood pressure, seek medical attention immediately. Otherwise, help the victim to cool off, and seek medical attention if the symptoms worsen or last for more than 1 hour. Cooling can be aided by cool, non-alcoholic beverages; rest; cool shower, bath, or sponge bath; an air-conditioned environment; lightweight clothing.

Heat Stroke

- Extremely high body temperature (above 103°F, orally)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness

What to do: Call for immediate medical assistance; get the victim to a shady area; cool the victim rapidly using whatever methods you can (e.g. immerse in a tub of cool water, place in a cool shower, spray with cool water from a garden hose, sponge with cool water, or, if the humidity is low, wrap in a cool, wet sheet and fan vigorously); monitor body temperature and continue cooling efforts until body temperature drops below 101-102°F.

The limitations of this study include a small number of heat-related deaths and potential misclassification bias as a result of using death certificates to determine cause of death. With only 21 heat-related deaths in this study, the numbers in specific sex and race categories might be too small to show a difference. Misclassification could have occurred in either direction. By using only death certificates to determine cause of death, we did not have access to a full medical history for these cases or the ambient temperature at the time of death; therefore we could not absolutely confirm that every indicated heat-related death was in fact so. Nonetheless, we are reasonably confidant of most of the diagnoses, and, in fact, for 11 of the 21 heat-related deaths an autopsy was performed. On the other hand, a number of studies have shown that during heat waves, all-cause mortality often increases significantly more than deaths classified as heat-related alone.[10] Therefore, the 21 heat-related deaths described here probably underestimate the true total. In addition, the Wisconsin Bureau of Health Information has not yet published the official counts for hyperthermia-related deaths, and therefore numbers could change.

In general, similar at-risk groups were affected by the heat wave in 1999 and 1995, including individuals living in metropolitan central cities, high-poverty areas, the elderly, persons suffering from chronic disease and alcoholism, and persons taking psychotropic medications.[2] Many of these deaths might be prevented with efforts targeted at these vulnerable populations. On the basis of this and other studies,[2,5,6,7,10,11] attention must be paid to the chronic health conditions that contribute significantly to the cause of death during periods of excessive heat exposure. Of particular concern are persons with cardiovascular conditions. In our findings, people with cardiovascular conditions stand out dramatically as being at increased risk for death due to hyperthermia or environmental heat stress. The similar concern holds for people with mental illness and those using psychotropic medications. Although contributing to a smaller percentage of the heat-related deaths, the underlying population at risk because of psychiatric factors is probably smaller than those at risk because of cardiovascular factors. Thus, it is imperative that prevention measures and weather advisory messages during excessive heat emergencies be targeted to these groups.

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Impact of *Haemophilus influenzae* type b (Hib) Conjugate Vaccines on *Haemophilus influenzae* Meningitis in Wisconsin

Patrick J. Enders, MD, Mary Jo Trepka, MD, MSPH, and Jeffrey P. Davis, MD

ABSTRACT

The first effective *Haemophilus influenzae* type b (Hib) conjugate vaccines were approved for use in children and infants between 1987 and 1990. In 1993, the federal government began the Childhood Immunization Initiative (CII), a program to improve the rate of vaccination of children nationwide. Subsequently, the proportion of 19 to 35-month-old children who received three or more doses of Hib vaccine rapidly increased from 28% in 1992 to 90% by 1995, with a concurrent dramatic decline in the incidence of *H. influenzae* meningitis. We reviewed cases of *H. influenzae* meningitis reported to the Wisconsin Division of Public Health from 1981 to 1997. The mean annual incidence of *H. influenzae* meningitis declined 96% from 2.4 cases per 100,000 persons in the pre-vaccination period (1981-1986) to less than 0.1 case per 100,000 persons after Wisconsin had achieved 90% Hib vaccination coverage (1994-1997). *H. influenzae* meningitis occurrence declined dramatically among all age groups, including 96% among children aged less than 1 year old, 99% among 1-4 and 5-9 year olds, and 46% among persons 10 or more years old. Consistent with national trends, the majority of *H. influenzae* meningitis cases reported in 1997 was caused by non-type b strains of *H. influenzae*.

INTRODUCTION

Haemophilus influenzae has been a cause of significant morbidity and mortality among young children, and the majority (95%) of cases of invasive disease has historically been associated with the most virulent strain of the bacterium, *Haemophilus influenzae* type b (Hib).[1] Prior to the development of effective Hib vaccines, Hib was the most frequent cause of bacterial meningitis in children under 5 years of age, as well as a common cause of pneumonia, epiglottitis, and other invasive bacterial infections in this age group.[1] The incidence of Hib disease peaked at 6-7 months of age and tapered off gradually with increasing age.[1-3] By 6 years of age, Hib disease became rare, as most children developed natural humoral immunity to *H. influenzae* type b, either by exposure to Hib or to antigenically cross-reacting organisms.[3]

Several conjugate vaccines were shown to be effective in inducing immunity against Hib and in reducing susceptibility to Hib disease.[2,4,5] The Hib conjugate vaccine PRP-D approved by the Food and Drug Administration (FDA) in 1987 induced effective immunity only in children over 18 months of age and did not protect those who were most susceptible to Hib disease.[2] The FDA approved HbOC and PRP-OMP, two Hib vaccines effective in infants as young as 2 months old, in October 1990.[4] General administration of these vaccines was effective in protecting the immunized individuals and in reducing Hib disease in unimmunized individuals by dramatically reducing Hib carriage rates.[4,6]

Although these vaccines were available in 1990, many children in the United States did not receive them. The Centers for Disease Control and Prevention (CDC) National Health Interview Survey (NHIS) estimated that in 1992, only 28% of children aged 19 to 35 months had received a course of three or more doses of Hib vaccine.[7] In 1993, the federal government instituted the Childhood Immunization Initiative (CII), a program intended to improve childhood vaccination rates to at least 90% by 1996 through increased availability of free vaccine and a system of financial rewards to states which improved their immunization rates.[8] In the first year of the program, an estimated 55% of U.S. 19 to 35-month-olds had

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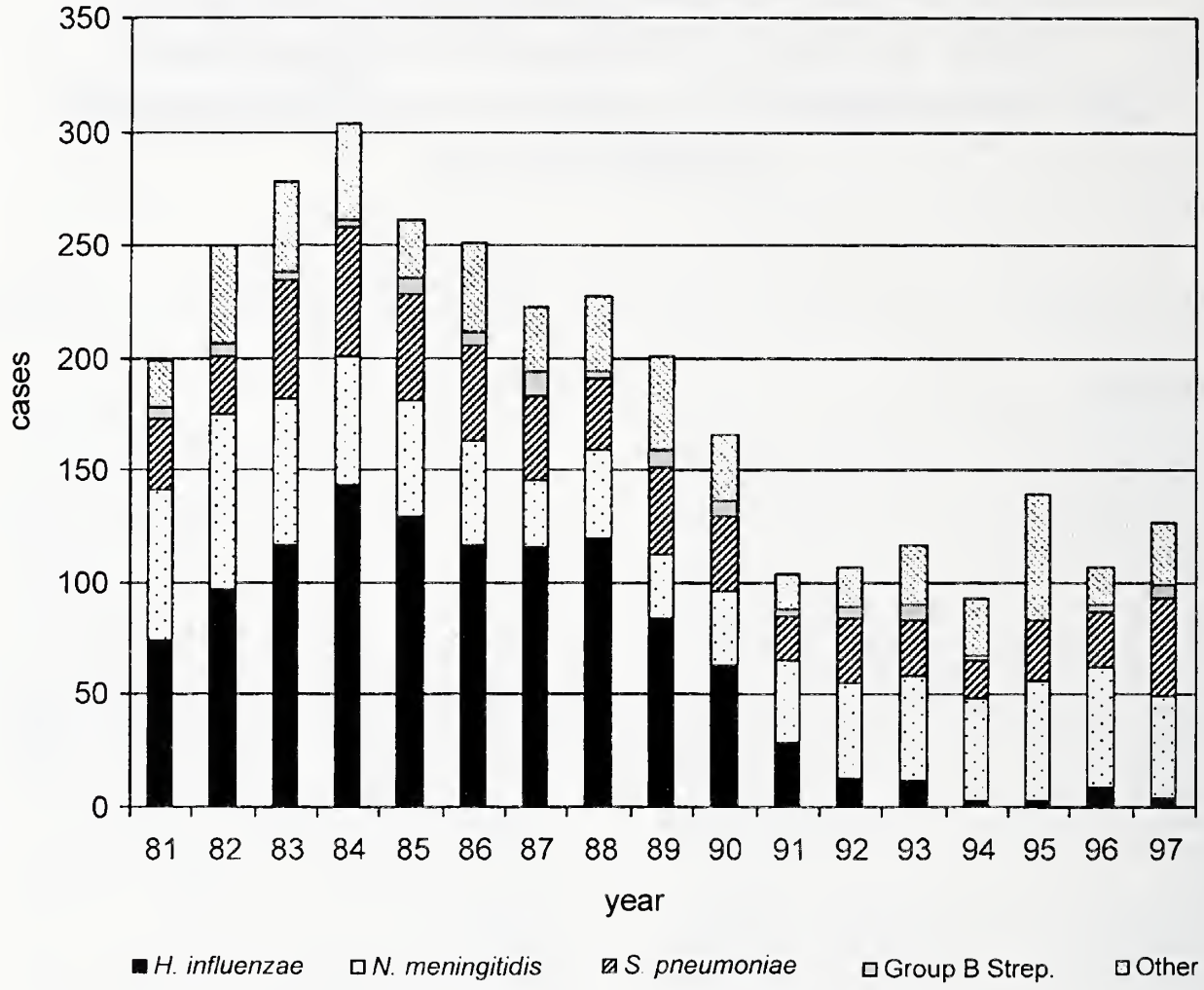
Figure 1. Reported cases of bacterial meningitis in Wisconsin by associated organism, 1981–1997



completed a course of 3 Hib vaccine doses.' That level reached 86% by mid-1994, and 92% by the second quarter of 1995.[9] Based on CDC National Immunization Survey (NIS) estimates, Wisconsin 19-35 month olds reached 90% Hib vaccine coverage between April 1994 and March 1995.[10] By 1996, the NIS estimated that Hib vaccine coverage reached 92% in Wisconsin and nationally.[11] With the widespread use of Hib vaccine, the CDC reported a 97% reduction in the incidence of invasive *H. influenzae* disease among children aged < 5 years between 1987 and 1997.[12]

The purpose of this study is to examine changes in the occurrence of *Haemophilus influenzae* meningitis in Wisconsin before and after the widespread use of Hib conjugate vaccines.

METHODS

Because *H. influenzae* invasive disease other than meningitis was not officially reportable in Wisconsin prior to 2000, we reviewed the cases of *H. influenzae* meningitis and meningitis caused by other bacteria that were reported to the Wisconsin Division of Public Health (DPH) from 1981 to 1997. Because meningococcal meningitis often cannot be discerned in case reports of meningococcal disease, we included all cases of meningococcal disease in the category of bacterial meningitis other than *H. influenzae.* On April 1, 2000, all cases of *H. influenzae* invasive disease became officially reportable. Prior to April 1, 2000, state physicians, laboratory personnel and hospital infection control practitioners were required to report all observed cases of bacterial meningitis to the DPH. A supplemental bacterial meningitis case report form included information on the bacterial etiologic agent and *H. influenzae* serotype. This DPH surveillance system includes records of all reported cases of bacterial meningitis among Wisconsin residents, including reciprocal reports from other state public health de-

partments of cases in Wisconsin residents diagnosed or treated in out-of-state hospitals. Inclusion of a case report in this database required laboratory isolation of *H. influenzae* from a normally sterile site in a patient with a clinical illness compatible with bacterial meningitis.

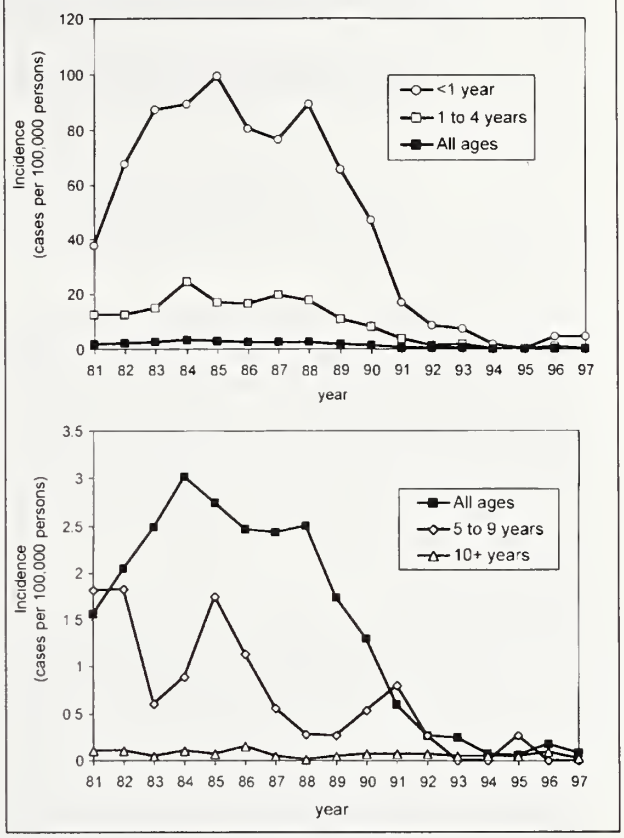
The study interval includes three periods: 1) 1981-1986, which precedes the availability of Hib conjugate vaccines; 2) 1987-1993 a transition phase when conjugate vaccines were approved first for children 15-18 months old and then for 2-month-olds, but national Hib vaccination levels (receipt of 3 or more doses of Hib conjugate vaccine) remained below 55% of 19-35 month olds; and 3) 1994-1997 when Hib vaccination levels reached and exceeded the target level of 90% vaccination of 19-35 month olds. To assess changes in *H. influenzae* meningitis occurrence within several age groups, we compared the average annual incidence rates from 1994-1997 to the average annual incidence rates of *H. influenzae* meningitis during 1981-1986. Population estimates (Bureau of Health Statistics, Wisconsin Department of Health and Family Services) for each year in the study interval were used to calculate rates.

Prior to the initiation of an invasive bacterial disease surveillance by DPH in 1998, the state's meningitis surveillance was primarily dependent upon private provider-initiated reports. Because under-reporting is inevitable in such a system, we examined whether any change in the rate of under-reporting during the 17-year study interval skewed our estimate of changes in the incidence of *H. influenzae* meningitis. We reviewed a database of all hospital discharges in Wisconsin from 1989 to 1994 and calculated an estimate of the incidence of *H. influenzae* meningitis based on the number of hospitalizations with a discharge code for "bacterial meningitis due to *Haemophilus influenzae*" (ICD-9 code 320.0). To examine completeness of *H. influenzae* surveillance, when possible we matched cases in the discharge database using birth date, sex, race, ethnicity, encrypted name code, admitting hospital and calendar quarter of discharge with cases reported to the state surveillance system.

RESULTS

The annual numbers of reported cases of *Haemophilus influenzae* meningitis and bacterial meningitis associated with other pathogens are included in Figure 1. Annual incidence rates of *H. influenzae* meningitis, including age-specific rates, are presented in Figure 2a and 2b. The mean annual incidence of *Haemophilus influenzae* meningitis in the general population declined 96% from 2.4 cases per 100,000 persons during 1981-1986 to 0.09 cases per 100,000 in 1994-1997. The rate during 1994-1997 represents just 3 to 9 reported cases of *H. influenzae* meningitis per year;

Figures 2a and 2b. Incidence rates of Haemophilus influenzae meningitis in Wisconsin by age group, 1981–1997



the annual peak of 143 cases occurred in 1984. Reductions in *H. influenzae* meningitis incidence rates were observed in all age groups, but most markedly among the younger age groups. Between 1981-1986 and 1994-1997 the mean annual reported incidence of *H. influenzae* meningitis declined 96% among infants less than one year old (from 76.7 cases per 100,000 persons to 2.6 cases/100,000), 99% among 1-4 year olds (from 16.2 to 0.18/100,000), 99% among 5-9 year olds (from 1.3 to 0.007/100,000), and 46% among those 10 or more years old (from 0.095 to 0.051/100,000). In contrast, during 1981-1997, the annual number of cases of meningococcal disease and bacterial meningitis caused by organisms other than *H. influenzae* in aggregate ranged between 73 cases (1991) and 152 cases (1984) with a median of 110 cases. Of note, the number of such cases in 1981 (120), 1989 the study interval midpoint (110) and 1997 (112) were very similar.

We found similar trends in *H. influenzae* meningitis in the hospital discharge database. Although data antecedent to 1989 were not available, between 1989-1990 and 1991-1994, reductions in *H. influenzae* associated discharges were 84% among children less than 1 year old, 83% among 1-4 year olds, and 70% among 5-9 year olds. We also found that 38% of

cases in individuals with discharge diagnoses of *H. influenzae* meningitis were not reported to the state surveillance system. While we believe this partly reflects underreporting, we also found the discharge code was used not only for patients with acute bacterial meningitis, but also for patients treated for the sequelae of the disease. Importantly, we found no temporal trend in the discrepancy between the two databases, and therefore concluded that while there was a degree of underreporting, it was not likely to have greatly affected the observed trends in the meningitis incidence rates.

Serologic typing information was limited during most of the study period. From 1991 to 1995, serotyping was recorded in only 25% of cases of *H. influenzae* meningitis and all of those cases were Hib. In 1996, four of the 9 cases were caused by nontype b strains, and no information was available for the other 5 cases. In 1997 3 of 4 cases involved non-b strains and 1 case involved Hib.

DISCUSSION

The incidence of Hib meningitis has fallen dramatically following the introduction of Hib conjugate vaccines. Our observed results in Wisconsin are consistent with changes seen nationally and internationally in areas where a high level of Hib conjugate vaccination has been achieved.[12-15] One important finding of our study (which has not been reported nationally) is the dramatic (99%) reduction in *H. influenzae* meningitis among older children aged 5 to 9 years—a population that has typically been included among all persons 5 years and older for the purposes of Hib disease analysis.[12] Our findings among these older children are not unexpected, as many are likely to have received Hib conjugate vaccines. By 1993, one-half of 5-9 year olds would have been eligible for Hib conjugate vaccination as infants or toddlers, and by 1996 all children in this age group would have been eligible. Reduced exposure to Hib no doubt also contributed to the reduction in *H. influenzae* meningitis in this age group, as multiple investigations have demonstrated the effectiveness of Hib conjugate vaccines in reducing Hib carriage as well as invasive disease, thus reducing the risk of Hib exposure for unvaccinated children.[6,16,17] Our results reflect findings from a recent study in Finland, where broad Hib immunization was first implemented, in which a significant decline in acute epiglottitis incidence was observed in adults of all ages after widespread Hib immunization of infants.[18]

The dramatic reduction of Hib meningitis in the young has resulted in a significant change in the demographic features of bacterial meningitis. In Wisconsin, the virtual elimination of *H. influenzae* meningitis has resulted in a 55% reduction in reported bacterial meningitis cases between 1981-1986 and 1994-1997. While *H. influenzae* was formerly the most frequent cause of bacterial meningitis, *Neisseria meningitidis* and *Streptococcus pneumoniae* are currently the most frequent causes. This mirrors nationally reported trends in the relative importance of the bacterial pathogens commonly associated with bacterial meningitis. CDC investigators also have observed that the precipitous decline of *H. influenzae* disease among the young has dramatically shifted the median age of bacterial meningitis cases in the United States, from a median 15 months of age in 1986 to a median of 25 years of age in 1995.[19]

There is also good evidence that the majority of invasive *H. influenzae* disease is now caused by non-type b strains of *H. influenzae*. Previous studies in the prevaccination era report only 5% of *H. influenzae* invasive disease was caused by nontype b *H. influenzae* strains.[1] However, the CDC has reported that in 1996 and 1997 only 32% and 41%, respectively, of serotyped invasive *H. influenzae* disease in children aged less than 5 years was caused by Hib.[12,19] Although reported serologic data during the study interval were limited, during 1997-1999 4 of 9 isolates of *H. influenzae* obtained from children less than 5 years old were type b, 4 were non-typeable and 1 was not typed. The 4 Hib cases occurred in 1 day, 3 month, 5 month and 8 month old infants, none of whom received Hib vaccine (unpublished data, S. Ahrabi-Fard, DPH).

Because Hib strains colonize the nasopharynx in an estimated 0.5%-3% of normal infants and children and colonization can be briefly transient or last for months without symptoms, age appropriate Hib vaccination beginning at 2 months is the most important method to protect children from Hib invasive disease. Surveillance for *H. influenzae* invasive disease is needed to continuously monitor the effectiveness of Hib vaccination programs and the impact of disease caused by non-type b strains.[3,12]

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HIV Infection in Wisconsin: State and National Resources for Clinicians and Patients

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ABSTRACT

The authors review state and national resources for clinicians and patients regarding HIV infection, highlighting pertinent resources in the Wisconsin AIDS/HIV Program as well as select local and national resources.

INTRODUCTION

A diagnosis of human immunodeficiency virus (HIV) disease or acquired immunodeficiency syndrome (AIDS) can challenge the resourcefulness of clinicians and patients. Because HIV disease and the life issues faced by many persons with HIV disease are complex, clinicians and patients rely on a variety of resources to address the needs of persons with HIV disease. The article reviews local, state and national resources that can assist clinicians and patients in addressing the challenges of HIV disease.

Resources useful for clinicians and patients are available at local, regional, state and national levels. Various state agencies manage health programs benefiting persons with HIV infection. The Wisconsin AIDS/HIV Program in the Division of Public Health (Wisconsin Department of Health and Family Services) is the lead state agency responsible for coordinating Wisconsin's public health response to the HIV epidemic. At local and regional levels, AIDS service organizations (ASOs) and other agencies provide direct client services such as HIV counseling and testing, early intervention, case management, housing assistance, legal services, prevention education, prevention case management, targeted risk reduction services and a variety of other services. Other agencies in Wisconsin and throughout the nation provide medical consultation, clinician education, and various consumer information and referral services.

Wisconsin AIDS/HIV Program Resources: The Wisconsin AIDS/HIV Program oversees various programs and activities, including epidemiologic surveillance and investigation, partner counseling and referral services, drug and insurance benefit programs for persons with HIV disease, and grant programs for care, treatment, and prevention services.

HIV Surveillance and Epidemiologic Program: The HIV Surveillance and Epidemiologic Investigation Program in the Wisconsin AIDS/HIV Program monitors reported cases of HIV infection and AIDS. It compiles epidemiologic information and actively solicits case reports through established contacts with laboratories, clinicians, health care facilities, state correctional facilities, military entrance processing stations, and through a variety of other mechanisms. A comprehensive HIV surveillance system assists in measuring and monitoring the impact of HIV and AIDS in terms of disease incidence and mortality. Much of HIV surveillance focuses on case findings. This provides the data upon which other activities (trend analysis, partner notification, early intervention and prevention activities) are based.

HIV Counseling and Testing: HIV counseling and testing services are critically important in the early identification of HIV infection, in accessing HIV positive persons to needed health and support services, and in providing HIV prevention counseling services to persons at risk for HIV infection.

HIV testing occurs in a variety of settings in Wisconsin, including medical clinics, hospitals and publicly funded counseling and testing sites. Primary care providers play a key role in the diagnosis and management of HIV infection in Wisconsin. Approximately

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80% of HIV infections in Wisconsin are identified by physicians in the private sector. The Wisconsin AIDS/HIV Program has published guidelines for HIV testing and to support the role of primary care clinicians in the early identification of HIV infection.[1,2]

Universal counseling and voluntary HIV testing of pregnant women is now a standard of clinical practice and has been a priority for the Wisconsin AIDS/HIV Program and the federal government for several years. In 1994, the National Institutes of Health AIDS Clinical Trial 076 demonstrated that AZT (zidovudine) could reduce perinatal HIV transmission from some infected women to their newborn infants by as much as two-thirds. In response, the CDC, the Wisconsin AIDS/HIV Program, and affiliated partners (Statewide Workgroup on HIV Education and Testing in the Perinatal Period) under the auspices of the Wisconsin Association for Perinatal Care (WAPC) released recommendations and guidelines highlighting the importance of HIV counseling and voluntary testing for all pregnant women.[3,4,5] The Wisconsin AIDS/HIV Program contracted with the WAPC and the Wisconsin HIV Primary Care Support Network, located at Children's Hospital of Wisconsin and the Medical College of Wisconsin, to conduct statewide training of prenatal care providers on HIV counseling and testing of pregnant women. The Wisconsin AIDS/HIV Program developed education materials for providers and consumers, including consumer prenatal HIV education brochures published in English, Spanish and Hmong. Information on the availability of professional educational materials and/or consumer prenatal HIV education brochures can be obtained from the Wisconsin AIDS/HIV Program at 608-267-5287. The federal Health Care Financing Administration (HCFA) has also developed prenatal HIV educational materials for consumers and health care providers. Information on HCFA materials can be obtained from the HCFA Internet web site at *http://www.hcfa.gov/hiv*.

For clients who are high risk for HIV infection and would not otherwise receive HIV testing through a primary care provider, the Wisconsin Division of Public Health subsidizes HIV testing at designated counseling and testing sites. This testing occurs in local health departments, STD clinics, family planning agencies, tribal health clinics, community health centers, AIDS service organizations and other private nonprofit agencies. Clients receive risk assessment, personalized risk reduction education, free or low-cost testing, and referral for medical and supportive services. Information on the location of publicly funded HIV counseling and testing sites is available through the Wisconsin AIDSline at 800-334-AIDS (toll-free) or 273-AIDS (in Milwaukee) and the Internet web site of the Wisconsin AIDS/HIV Program listed below.

Wisconsin Partner Counseling and Referral Services Program: Since its inception in 1988, HIV Partner Counseling and Referral Services (PCRS), formerly known as Partner Notification, has been an important prevention strategy. PCRS offers persons with HIV disease an opportunity to meet with a public health professional to obtain counseling; assistance with the notification of sexual and needle-sharing partners without disclosing the identity of the infected partner; access to free, voluntary and confidential counseling; and referral for medical care, case management and support and other related services.

An attempt is made by PCRS state or local health department staff to contact and counsel each individual with HIV infection or AIDS who is reported to the Wisconsin AIDS/HIV Program. Cases are assigned to the PCRS staff person (counselor) in the health department that has jurisdiction in the community where the person with HIV disease resides. PCRS staff have 90 days to initiate, interview, counsel, notify and test partners, assess TB status, and close newly assigned cases.

During a partner notification meeting, which may last 30 minutes to an hour, the PCRS counselor informs the partner he/she has had contact with an individual who is HIV antibody positive. The counselor provides the partner with information on HIV/AIDS and risk reduction, and strongly encourages and offers immediate ("field-based") HIV antibody testing.

Wisconsin AIDS/HIV Drug Reimbursement Program: The Wisconsin AIDS/HIV Drug Reimbursement Program (ADRP), authorized by Wisconsin statutes, is designed to maintain the health and independence of persons living with HIV infection in Wisconsin by providing access to antiretroviral drugs and HIV-related prophylactic medications.

To be eligible to receive benefits under the ADRP, an individual must:

- live in Wisconsin;
- have HIV infection, confirmed by a physician
- have no or insufficient third party payment; and
- have a family income that does not exceed 200% of the federal poverty guideline.

ADRP applications are available statewide through AIDS service organizations, community-based organizations and the offices of physicians specializing in the treatment of HIV disease. Completed applications are mailed to the ADRP at the Division of Public Health (DPH) for eligibility screening. The ADRP sends

eligibility approval letters to the client and the client-selected pharmacy. The pharmacy receives both the approval letter and the physician's prescription for ADRP drugs. The designated pharmacy dispenses a 30-day supply of approved medications to the client and submits billing for these prescriptions to the ADRP.

The ADRP attempts to ensure that all FDA approved HIV-related antiretrovirals and HIV-related prophylactic medications are reviewed and carefully considered for inclusion in ADRP by a panel of physicians and the Wisconsin Department of Health and Family Services. The ADRP currently covers the 15 HIV antiretroviral drugs and 19 HIV-related prophylactic medications (Table 1) and monitors the formulary to ensure consistency with current standards of HIV care.

Wisconsin AIDS/HIV Health Insurance Premium Subsidy Program: The AIDS/HIV Health Insurance Premium Subsidy Program helps persons with HIV maintain access to health insurance when they reduce their work hours, take unpaid medical leave or terminate employment. The program does this by subsidizing (covering all or part of the cost of) policy premiums. The program began in state fiscal year (SFY) 1991 and is currently authorized under Wisconsin statute ss. 252.16 & 252.17. To be eligible, an individual must:

- live in Wisconsin;
- have family income that does not exceed 300% of the federal poverty guideline;
- have a doctor certify that the individual has HIV infection and had to quit work, reduce work hours or take an unpaid medical leave from employment due to an HIV-related medical condition;
- have or be eligible for health insurance coverage under a group health plan or an individual health plan.

Individuals with income between 201% and 300% of poverty are required to cover 3% of the cost of their annual premium.

The program subsidizes premiums for group health continuation coverage, Medicare supplement policies and individual policies. To apply for the program, clients typically work with case managers who are located at AIDS service organizations throughout Wisconsin. The case managers assist clients in completing the program application and then forward the application on to the Premium Subsidy Program staff. If the client meets the program eligibility requirements, their employer and/or insurance company is contacted to set up payment of the client's monthly insurance premium.

Table 1. Wisconsin AIDS Drug Reimbursement Program (ADRP) Formulary (as of January 1, 2000)

Antiretrovirals
- AZT (Retrovir, zidovudine)
- abacavir (Ziagen)
- amprenavir (Agenerase)
- combivir (zidovudine+lamivudine)
- ddI (Videx, didanosine
- ddC (HIVID, zalcitabine)
- d4T (Zerit, stavudine)
- delavirdine (Rescriptor)
- efavirenz (Sustiva)
- indinavir (Crixivan)
- lamivudine (Epivir, 3TC)
- nelfinavir (Viracept)
- nevirapine (Viramune)
- ritonavir (Norvir)
- saquinavir (Fortovase, Invirase)

Other *HIV-Related Medications*
- acyclovir (Zovirax)
- amphotericin B (Fungizone)
- atovaquone (Mepron)
- azithromycin (Zithromax)
- clarithromycin (Biaxin)
- clindamycin (Cleocin)
- Dapsone
- fluconazole (Diflucan)
- ganciclovir (Cytovene)
- ganciclovir implant (Vitrasert)
- hydroxyurea (Hydrea)
- itraconazole (Sporanox)
- ketoconazole (Nizoral)
- leucovodn (VVellcovorin)
- pentamidine (Nebupent)
- pyrimethamine (Daraprim)
- rifabutin (Mycobutin)
- sulfadiazine (Sulfadiazine Tablets)
- TMP/SMX (Bactrim, Septra)

The Wisconsin AIDS/HIV Program maintains an Internet web site with descriptive summaries of activities overseen and coordinated by the Wisconsin AIDS/HIV Program; quarterly HIV surveillance and other epidemiologic reports; information on national, state, regional, and local resources; a calendar of events; and links to other national, state regional and local Internet-based information resources. The address of the AIDS/HIV Program's web site is *http://www.dhfs.state.wi.us/AIDS-HIV/index.htm*.

LOCAL AND REGIONAL RESOURCES

Wisconsin AIDS Service Organizations and Community-Based Organizations: Since 1986, a statewide network of AIDS service organizations (ASOs) and community-based organizations (CBOs) have been funded by the Wisconsin Department of Health and Family Services to address HIV-related prevention and case management needs of Wisconsin residents. Funds administered by the Wisconsin AIDS/HIV Program and contracted to ASOs and CBOs support local agencies in conducting activities in the areas of prevention education and risk reduction services, life care services and early intervention and Ryan White consortia. ASO office locations and contact information are listed in Table 2.

Prevention Education and Risk Reduction activities target individuals and communities at risk for acquiring or transmitting HIV. Examples of targeted groups include men who have sex with men, injection and other drug users, adolescents, communities of color, women in poverty, HIV positive persons and incarcer-

Table 2. Regional offices of designated Wisconsin AIDS service organizations

Northern Region
AIDS Resource Center of WI
1105 Grand Ave, Suite 3
Schofield, WI 54476
715.355.6867
FAX 715.355.7684

Northeastern Region
AIDS Resource Center of WI
824 S Broadway St
Green Bay, WI 54304
920.437.7400
800.675.9400
FAX 920.437.1040

AIDS Resource Center of WI
120 N Morrison St,
Suite 201
Appleton, WI 54911
920.733.2068
800.773.2068
FAX 920.733.7786

Western Region
AIDS Resource Center of WI
505 Dewey St,
South Suite 107
Eau Claire, WI 54701
715.836.7710
800.750.2437
FAX 715.836.9844

AIDS Resource Center of WI
Grandview Center
1707 Main St, Suite 420
La Crosse, WI 54601
608.785.9866
FAX 608.784.6661

AIDS Resource Center of WI
Board of Trade Building
1507 Tower Ave, Suite 230
Superior, WI 54880
715.394.4009
877.242.0282 (toll free)
FAX 715.394.4066

Southern Region
AIDS Network
600 Williamson St
Madison, WI 53703
608.252.6540
800.486.6276
FAX 608.252.6559

AIDS Network
101 Milwaukee St, #96
Janesville, WI 53545
608.756.2550
800.486.6276
FAX 608.756.2545

AIDS Network
830 Broad St
Beloit, WI 53511
608.756.2550
608.364.4027
800.426.6276

Southeastern Region
AIDS Resource Center of WI
820 N Plankinton Ave
Milwaukee, WI 53203
414.273.1991
800.359.9272
FAX 414.273.2357

AIDS Resource Center of WI
1212 57th St
Kenosha, WI 53140
414.657.6644
800.924.6601
FAX 414.657.6949

ated individuals. Prevention education focuses on maintaining and sustaining positive health behaviors.

Life Care Services are provided through a network of AIDS service and community-based organizations that coordinate case management for persons with HIV infection. Staff provide support services to infected persons, their friends, family members, and care providers. The *Early Intervention Program* provides persons recently diagnosed with HIV infection prompt and early access to needed medical care and related services.

AIDS service and community-based organizations also provide services supported with federal Ryan White CARE Act funds. These include housing assistance, legal services, emergency financial assistance, benefits counseling, dental care, mental health services, respite care, transportation, bilingual/bicultural services, health care for indigent clients, food pantry services, nutrition education, and nursing case management. Additional program activities are supported with a variety of other state, federal, and private funds and include programs for disabled persons to return to work.

Wisconsin HIV Primary Care Support Network: The Wisconsin HIV Primary Care Support Network is a collaborative effort between Children's Hospital of Wisconsin, Medical College of Wisconsin, Marshfield Clinic and University of Wisconsin Children's Hospital. The primary focus of the Support Network are families of children, adolescents and women with HIV disease. A team of physicians, nurses, and social workers support local health care providers in delivering comprehensive, culturally-competent, family-centered, coordinated care in a family's home community. Network staff provide education and training, assistance with care coordination, and ongoing consultation to health care providers. For more information, contact the Wisconsin HIV Primary Care Support Network at 414.456.4162.

Wisconsin AIDS Research Consortium: The Wisconsin AIDS Research Consortium (WARC) is a statewide HIV/AIDS research organization dedicated to providing access to clinical drug trials for people with HIV throughout Wisconsin. WARC is composed of Wisconsin's leading HIV/AIDS physicians and experienced clinical staff. The Consortium works with physicians throughout Wisconsin in order to make clinical drug trials directly accessible in both urban and rural areas. For further information, contact WARC at 1.800.359.9272 extension 248 or 414.225.1548 or visit the WARC Internet web site at *http://www.arcw.org/Research/index.html.*

Midwest AIDS Training and Education Center-Wisconsin Site: The Wisconsin site of the Midwest AIDS Training and Education Center (MATEC)

provides HIV-related education and training to health professionals through conferences, seminars, preceptorship programs and educational activities. It is a joint project between the University of Wisconsin Medical School and the AIDS Resource Center of Wisconsin and is part of a midwest regional network of educational and training programs for health professionals coordinated by the University of Illinois in Chicago. For more information on MATEC activities and resources in Wisconsin, contact Theresa Lenaghan at 608.258.9103 ext. 15 or visit the MATEC Internet web site at *http://www.arcw.org/TrainingEducation/MATEC/index.html.*

Wisconsin AIDS Library: The Wisconsin AIDS Library, located at the AIDS Resource Center of Wisconsin in Milwaukee, is a statewide resource for HIV and AIDS information. The Library has a collection of over 1,000 books, periodicals, videos, and an extensive clipping file on a wide range of topics related to HIV and AIDS. Many library materials can be obtained by mail and requests for online research can be made by telephone. To contact the Wisconsin AIDS Library, call 800.359.9272, ext. 239 or 414.225.1539 in Milwaukee.

Wisconsin AIDSline: The Wisconsin AIDSline is a toll-free service that offers quick answers to questions relating to HIV and AIDS. The line is staffed by adult volunteers during business hours Monday through Friday and is forwarded to the National Sexually Transmitted Disease Hotline during evenings and weekends. The Wisconsin AIDSline phone numbers are 800.334.AIDS (toll-free) or 414.273.AIDS.

Wisconsin Educational Resources: In addition to the prevention education resources in ASOs and CBOs, local chapters of the American Red Cross have print and video educational materials and can assist in locating speakers to address community groups. The yellow pages of local phone directories contain phone numbers of local chapters of the American Red Cross. The local Cooperative Educational Service (CESA) office of the Wisconsin Department of Public Instruction (608.266.0963) has information regarding school curricula and materials for educating children and adolescents.

SELECT NATIONAL INFORMATION AND REFERRAL SOURCES

AIDS Treatment Information Service: The HIV/AIDS Treatment Information Service (ATIS) is a federally supported information clearinghouse that serves as a repository for federally-approved treatment guidelines for HIV and AIDS. ATIS is staffed by multilingual health information specialists who answer questions on HIV treatment options using a network of federal, national, and community-based information resources. Contact ATIS at 1.800.448.0440 or the ATIS Internet web site at *http://www.hivatis.org*.

AIDS Clinical Trials Information Service (ACTIS): ACTIS is a federally sponsored agency that provides current information on federal and private sponsored clinical drug trials for persons with AIDS and HIV infection. Contact information: 1.800.874.2572 (toll-free phone); 1.888.480.3739 (toll-free TTY); *http://www.actis.org* (Internet web site).

CDC - Division of HIV-AIDS Prevention (DHAP): The Centers for Disease Control and Prevention's (CDC) Division of HIV-AIDS Prevention (DHAP) is CDC's lead agency responsible for coordinating and directing HIV/AIDS prevention and surveillance programs and activities. DHAP's Internet site includes: basic HIV/AIDS-related statistics; conference information; funding opportunities, consumer-oriented health information, links to other sites; media campaign materials; publications and other resources, slides and graphics; and training information. This site includes AIDS/HIV-related reprints from the MMWR and access to the AIDS Daily News Summaries through the National Prevention Information Network. See DHAP's Internet web site at *http://www.cdc.gov/hiv/dhap.htm.*

CDC National Prevention Information Network: (NPIN) The National Prevention Information Network (NPIN) is the information clearinghouse on HIV/AIDS, STD, and TB resources and information. It is sponsored by the federal Centers for Disease Control and Prevention and includes databases on organizations, educational materials, funding opportunities, news from scientific journals and the general media, conferences, periodicals and federal press releases. Contact NPIN at 800.458.5231 (telephone); 800.243.7012 (TDD); Internet web site: *http://www.cdcnpin.org*.

OTHER RESOURCES

For additional information and Internet links to a broad variety of resources, visit the Wisconsin AIDS/HIV Program's Internet web page containing links to other national and local resources:

http://www.dhfs.state.wi.us/aids-hiv/Links/AIDS-HIV-Links.htm

Further Information Regarding Resources In The Wisconsin Aids/HIV Program

Additional information on resources in the Wisconsin AIDS/HIV Program is available through the following contacts:

Program Direction
James M. Vergeront, MD: 608.267.5287

Care and Treatment Programs
Michael McFadden: 608.266.0682

Case Surveillance and Reporting
Jeannie Druckenmiller: 608.266.2664

Consumer and Professional Information Resources
Bill Reiser: 608.266.3073

Counseling and Testing
Kathleen Krchnavek: 608.267.3583

Drug Reimbursement Program
Janice Lipsey 608.261.6952; 1.800.991.5532

Epidemiology
Neil Hoxie: 608.266.0998

Insurance Premium Subsidy Program
Janice Lipsey: 608.261.6952; 1.800.991.5532

Life Care Services
Gail Nahwahquaw: 608.266.1122

Partner Counseling and Referral Services
Denise Johnson: 608.267.5288

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Prevention Community Planning
Molly Herrmann: 608.267.6730

Prevention in Communities of Color
Karen Johnson: 608.266.1808

Ryan White Consortia & Early Intervention Services
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Central Number for General Information
608.267.5287

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Antibiotic Susceptibility of Invasive *Streptococcus Pneumoniae* in Wisconsin, 1999

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ABSTRACT

Background. *Streptococcus pneumoniae is* a major cause of community acquired infections in the United States, and rates of antibiotic resistance have increased dramatically in the past decade. Statewide rates of pneumococcal resistance to penicillin and other antibiotics have not been previously reported in Wisconsin. To determine these rates, we assessed invasive pneumococcal isolates for reduced susceptibility to nine different antibiotics.

Methods. Pneumococcal isolates from blood, cerebrospinal fluid or other normally sterile body sites were submitted by 91% of laboratories that perform invasive bacterial cultures. Isolates were tested for susceptibility to penicillin, cefotaxime, ceftriaxone, levofloxacin, meropenem, erythromycin, vancomycin, sulfamethoxazole-trimethoprim and chloramphenicol.

Results. There were 409 invasive pneumococcal isolates identified in 1999 among Wisconsin residents, including 385 (94%) isolates from blood. The mean patient age was 42.5 years (range, <1 year to 96 years), and 213 (52%) were male. Of the pneumococcal isolates, 24%were not susceptible to penicillin, including 10% with high level resistance. Isolates with reduced penicillin susceptibility were also likely to have reduced susceptibility to other antibiotics. Patients with penicillin nonsusceptible (intermediate and fully resistant) pneumococcal isolates were significantly younger (mean, 37.0 years) than those with susceptible isolates (mean, 44.3 years) (p=.04). The proportion of patients with a penicillin nonsusceptible isolate varied by region, ranging from 12.8% in northeastern Wisconsin to 35.5% in northern Wisconsin.

Conclusions. The proportion of invasive pneumococcal isolates with penicillin resistance in Wisconsin is similar to other regions of the United States. Inappropriate antibiotic use contributes to the emergence of resistant pneumococcal infections, and educational efforts are underway to promote judicious antibiotic use in Wisconsin.

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INTRODUCTION

Respiratory tract and invasive infections caused by *Streptococcus pneumoniae* are a major source of morbidity and mortality among children and older adults.[1-3] During the past decade the prevalence of antibiotic resistant pneumococci has increased dramatically in the United States and other countries.[4,5] In 1997, an antibiotic resistance surveillance program at 27 US medical centers found that 27.8% of pneumococcal isolates had intermediate resistance to penicillin and 16.0% had high level resistance.[6] Multidrug resistance is common in respiratory isolates of S. *pneumoniae*.[6,7]

Only limited data are available regarding pneumococcal antibiotic susceptibility in Wisconsin. In Milwaukee, pneumococcal isolates at the Children's Hospital of Wisconsin were tested for antibiotic susceptibility for two 6-month periods in 1994-1995 (35 isolates) and 1996-97 (29 isolates).[8] The proportion of isolates that were nonsusceptible to penicillin was 27% to 28% in each time period, and the proportion with high level resistance was 14% and 18%, respectively.

During 1998, the Wisconsin Division of Public Health initiated enhanced surveillance for invasive bacterial infections in Wisconsin to monitor trends and identify outbreaks. To assess the statewide occurrence of pneumococcal antibiotic resistance, we performed antibiotic susceptibility testing for invasive isolates in 1999. This was initiated as one evaluation measure for the Wisconsin Antibiotic Resistance Network (WARN), a five-year project funded by the Centers

Table 1. Distribution of invasive *Streptococcus pneumoniae* by patient characteristics and source of isolate in Wisconsin, 1999

	# Isolates Tested	Intermediate Resistance (MIC 0.1-1.0)	Highly Resistant (MIC >_ 2.0)	Total Nonsusceptible
Gender				
Male	213	32 (15%)	20 (9%)	52 (24%)
Female	196	27 (14%)	21 (11%)	48 (25%)
Age				
0-4	108	17 (16%)	13 (12%)	30 (28%)
5-19	21	1 (5%)	1 (5%)	2 (10%)
20-39	57	13 (23%)	10 (18%)	23 (41%)
40-59	73	9 (12%)	8 (11%)	17 (23%)
60+	150	19 (13%)	9 (6%)	28 (19%)
Isolate Type				
Blood	385	54 (14%)	37 (10%)	91 (24%)
CSF	8	1 (13%)	0	1 (13%)
Other	16	4 (25%)	4 (25%)	8 (50%)
TOTAL	409	59 (14%)	41 (10%)	100 (24%)

for Disease Control and Prevention (CDC) to educate physicians and the public to reduce inappropriate antibiotic use.

METHODS

In April 1998, as part of an Epidemiology and Laboratory Capacity cooperative agreement with the Centers for Disease Control and Prevention, the Wisconsin Division of Public Health surveyed directors of 219 Wisconsin laboratories regarding capacity to test for invasive bacterial organisms. These laboratories were invited to participate in an enhanced surveillance for invasive infections with *H. influenzae, N. meningiditis, L. monocytogenes, S. pneumoniae,* and groups A and B *Streptococcus.* Invasive bacterial infections in this surveillance were defined as infection with isolation of any of the six bacteria from blood, cerebrospinal fluid or other normally sterile sites. Seventy-five laboratories that test for these organisms agreed to participate in the surveillance. Among these, 27 also serve as reference laboratories for another 42 laboratories that do not have the capacity to test for these organisms. This represents a 91% capture rate for potential invasive bacterial isolates in the statewide surveillance. Bacterial subcultures are submitted via courier service to the Wisconsin State Laboratory of Hygiene where specimen, demographic and clinical information is entered into an Excel spreadsheet. Each quarter *S. pneumoniae* specimens received since the previous quarter are subcultured onto blood agar and forwarded by courier service to the Marshfield Medical Research Foundation for antibiotic susceptibility testing. Isolates from non-Wisconsin residents were excluded from the study. If more than one *S. pneumoniae* isolate was received from the same patient, only the blood isolate was evaluated for antibiotic susceptibility.

All invasive isolates of *Streptococcus pneumoniae* were tested for susceptibility to penicillin, cefotaxime, ceftriaxone, levofloxacin, meropenem, erythromycin, vancomycin, sulfamethoxazoletrimethoprim, and chloramphenicol according to the National Committee for Clinical Laboratory Standards (NCCLS) guidelines.[9] Pneumococcal isolates were tested for susceptibility to penicillin using the E test.[10] According to NCCLS guidelines, a penicillin minimum inhibitory concentration (MIC) of 0.12μg/ml to 1.0μg/ml was classified as intermediate resistance, and a MIC of 2μg/ml or greater was classified as full resistance. If the E test yielded a MIC of 1.5μg/ml, the result was rounded up to 2.0μg/ml according to the E test technical guide.[11] Isolates with either intermediate or high-level resistance were classified as penicillin nonsusceptible.

Susceptibilities to cefotaxime, ceftriaxone, levofloxacin and meropenem were performed using the E test. For cefotaxime and ceftriaxone, an MIC concentration of >0.5 to 1μg/ml was classified as intermediate resistance and an MIC of >2μg/ml was classified as resistant. For levofloxacin, >2 to 4μg/ml was intermediate and >8μg/ml was resistant. For meropenem, > 0.25 to 0.5μg/ml was intermediate and > 1μg/ml was resistant.

Susceptibilities to erythromycin, vancomycin, sulfamethoxazole-trimethoprim and chloramphenicol were performed using disc diffusion. A 15μg erythromycin disc yielding a zone size of 16-20mm was classified as intermediate and a zone size of <15 mm was resistant. A 30μg vancomycin disc yielding a zone size of <17mm was classified as resistant. When a disc containing 23.75μg of sulfamethoxazole and 1.25μg of trimethoprim yielded a zone size of 16-18 mm, it was

classified as intermediate resistance. A zone size of <15mm was classified as resistant. A 30μg chloramphenicol disc yielding a zone size of <20mm was classified as resistant.

Laboratory results were entered into a SAS database with 10% double data entry for quality assurance. The laboratory results were linked to nonidentifying demographic data provided by the Wisconsin Division of Public Health.

RESULTS

A total of 409 invasive pneumococcal isolates were identified in 1999, including 385 (94%) isolates from blood. The mean patient age was 42.5 years (range, <1 year to 96 years), and 213 (52%) were male (Table 1). Twenty-four percent of the pneumococcal isolates were not susceptible to penicillin (PNP), including 10% with high level resistance (Table 2). Isolates with reduced penicillin susceptibility were also likely to have reduced susceptibility to other antibiotics (Table 3). The majority of isolates with high level penicillin resistance were also not susceptible to erythromycin or trimethoprimsulfamethoxazole.

Intermediate and full penicillin resistance was most common in patients 20 to 39 years old. Patients with penicillin nonsusceptible (intermediate and fully resistant) pneumococcal isolates were significantly younger (mean, 37.0 years) than those with susceptible isolates (mean, 44.3 years) (p=.04, t-test). Patients with fully resistant isolates were also significantly younger than those with susceptible isolates (mean, 33.9 years vs. 44.3 years, p=.05). The proportion of isolates with reduced penicillin susceptibility varied from 12.8% to 35.3% in the five public health regions of Wisconsin (p=.06, chi-square) (Figure 1). The proportion of isolates with high level penicillin resistance was 7.5% (5/67) in the western region, 8.8% (3/34) in the northern region, 9.6% (11/115) in the southern region, 8.5% (4/47) in the northeastern region, and 11.6% (17/146) in the southeastern region. The regional differences in high level penicillin resistance were not significant.

COMMENT

The proportion of invasive isolates with reduced penicillin susceptibility in Wisconsin is similar to the proportion reported by a national sentinel surveillance system. The CDC Active Bacterial Core Surveillance (ABC) program includes seven states and metropolitan areas in the United States, and the proportion of *S. pneumoniae* invasive isolates with intermediate and full penicillin resistance was 10.5% and 13.9%, respectively during 1998 (www.cdc.gov/ncidod/dbmd/abcs). The proportion of invasive isolates with high level penicillin resistance was lower in Wisconsin than Minnesota, where 16% of invasive *S. pneumoniae* isolates had high level resistance to penicillin in 1999 (MDH antibiogram, www.health.state.mn.us). An additional 8% of Minnesota isolates had intermediate resistance to penicillin in 1999.

We were unable to assess temporal trends in Wisconsin because comparable susceptibility data were not available for previous years. Nationally, there was a 64-fold increase in penicillin-nonsusceptibility from the mid-1980s to the early 1990s,[4] and the current rate of resistance in Wisconsin suggests that similar increases have occurred here.

Table 2. Reduced antibiotic susceptibility of 409 invasive *Streptococcus pneumoniae* isolates in Wisconsin, 1999

	Intermediate Resistance	Highly Resistant	Total Non-susceptible
Penicillin	59 (14%)	41 (10%)	100 (24%)
Cefotaxime	8 (2%)	37 (9%)	45 (11%)
Ceftriaxone	22 (5%)	3 (1%)	25 (6%)
Chloramphenicol	0	9 (2%)	9 (2%)
Erythromycin	0	57 (14%)	57 (14%)
Levofloxacin	0	0	0
Meropenem	3 (<1%)	18 (4%)	21 (5%)
TMP-SMX	10 (2%)	97 (24%)	107 (26%)
Vancomycin	0	0	0

Figure 1. Proportion of *Streptococcus pneumoniae* isolates with reduced penicillin susceptibility (intermediate and fully resistant) by public health region, 1999

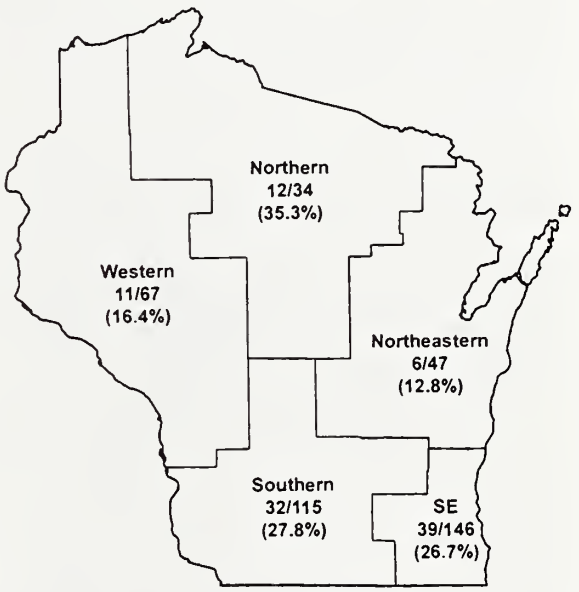

Table 3. Reduced susceptibility of invasive pneumococcal *Streptococcus pneumoniae* isolates to seven other antibiotics by penicillin susceptibility status

	Number (%) Nonsusceptible		
Penicillin Susceptibility Status	Pen Sensitive (MIC < 0.1) N=309	Pen Intermediate (MIC 0.1-1.0) N=59	Pen Highly Resistant (MIC > 2.0) N=41
Cefotaxime	0	8 (14%)	37 (90%)
Ceftriaxone	0	0	25 (61 %)
Chloramphenicol	2 (<1%)	3 (5%)	4 (10%)
Erythromycin	14 (5%)	11 (19%)	32 (78%)
Levofloxacin	0	0	0
Meropenem	0	3 (5%)	18 (44%)
TMP-SMX	39 (13%)	28 (47%)	40 (98%)

The prevalence of penicillin resistance may be higher among pneumococcal isolates from the upper respiratory tract, including isolates causing acute otitis media. Isolates from the upper respiratory tract tend to have a different serogroup distribution compared with invasive isolates, and the invasive isolates are more likely to be susceptible to penicillin.[12] The data reported here may therefore underestimate the prevalence of penicillin resistance among pneumococcal isolates causing otitis media or other upper respiratory tract infections. A study of nasopharyngeal carriage among children attending day care in northern Wisconsin found that up to 45% of isolates had reduced susceptibility to penicillin, although the majority of these isolates had intermediate rather than high level resistance.[13]

Multiple studies have demonstrated an association between carriage or infection with resistant pneumococci and recent antibiotic use.[14-22] Children under 15 years of age have the highest rate of antibiotic use,[23] and nearly half of all children with a diagnosis of the common cold or upper respiratory infection receive an antibiotic despite evidence that these conditions are usually viral.[24] Promoting judicious antibiotic use is therefore an important component of the public health response to community-acquired antibiotic resistance.

The Wisconsin Antibiotic Resistance Network (WARN) was established in 1999 with funding from CDC. WARN is a five-year collaborative project involving the Marshfield Medical Research Foundation, State Medical Society of Wisconsin and Wisconsin Division of Public Health. The major objectives of WARN include reducing inappropriate antibiotic prescribing in pediatric primary care settings, increasing public knowledge and awareness about antibiotic resistance and appropriate antibiotic use, and reducing the occurrence of antibiotic-resistant pneumococcal infections. Public education efforts focus on parents of young children (less than 5 years old). Major activities include distribution of posters, pamphlets and other materials to primary care clinics, local public health agencies, and child care centers. In addition, WARN staff give presentations to administrators and staff at larger child care centers throughout Wisconsin. Other public education resources include a website (www.wismed.org) and promotions at health fairs, schools and immunization clinics.

Clinician education will begin in fall 2000 and will include continuing medical education events and distribution of clinical practice "fact sheets" for common respiratory problems. The fact sheets will provide concise recommendations regarding diagnosis and management of acute otitis media, pharyngitis, sinusitis, and bronchitis/cough illness. The target audience includes licensed prescribers in pediatrics, family practice and urgent care/emergency medicine. Resource materials and policy recommendations regarding appropriate antibiotic use will be distributed to managed care organizations and large clinics. Antibiotic susceptibility testing of invasive pneumococcal isolates will continue in Wisconsin, and annual reports will be widely distributed to clinics, laboratories, and public health agencies.

In a survey of Wisconsin primary care clinicians in 1999, more than one-third of respondents indicated they could reduce antibiotic prescribing by 20% or more with no adverse impact on quality of care (unpublished data). A serious commitment to judicious antibiotic use by clinicians and the public will be necessary to achieve that reduction, and we are confident that this can be accomplished in Wisconsin.

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Proceedings from the 1999 Annual Meeting of the American College of Physicians - American Society of Internal Medicine, Wisconsin Chapter

Edited by Frank Graziano, MD, PhD

INTRODUCTION

The Wisconsin Chapter of the American College of Physicians/American Society of Internal Medicine annual meeting was held in Milwaukee Wisconsin September 16–18,1999. Once again, a highlight of our meeting was the presentation of posters and vignettes by residents from the five residency programs in the state (Gundersen Clinic, Marshfield Clinic, Medical College of Wisconsin, Mt. Sinai Hospital, and the University of Wisconsin Hospital and Clinics. So that all may appreciate the quality of our Internal Medicine residents and the quality of care given by these residents in our Wisconsin residency programs, the full text presentations for the poster and vignette sessions held at the Associates part of the meeting are presented below. Through the cooperation of the *Wisconsin Medical Journal*, we will publish these presentations yearly. However, there is nothing like the lively medical discussion these posters and vignettes produce at the ACP-ASIM meeting.

The Fungus Among Us: Disseminated Histoplasmosis (DH) in an Immunocompetent Host

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A 31-year-old previously healthy man was transferred to a general medicine service with 10 days of severe generalized headache, high-grade fever and bilateral pulmonary infiltrates. Previous work-up included normal LP, normal head CT and negative HIV tests. He has been treated for five days with doxycycline and ceftriaxone without improvement. On exam, temp was 39.5C. Scleral icterus was present. Lung CV and neurologic exams were unremarkable. Hepatosplenomegaly was present. Labs revealed WBC 4.4, hct 36, t.billi 3.4, AST 126, ALT 152. CXR showed diffuse small nodular pulmonary infiltrates. H. Capsulatum urinary antigen was strongly positive. Bone marrow biopsy showed histoplasma and non-caseating granulomas. The patient was diagnosed with DH and started on Amphotericin B. He defervesced on day two of therapy. All symptoms and lab abnormalities resolved. He was discharged on home IV AmphoB for a total of three weeks, followed by oral itraconazole.

Discussion: Histoplasmosis is caused by the divorphic fungi H. Capsalatum and is endemic in the Mississippi River Valley. The fungal spores are inhaled and hematogenous spread can occur. Though unusual, DH can occur in immunocompetent hosts. DH usually presents as fever, headache and pulmonary symptoms. Leukopenia, anemia and hepatitis are common. H. Capsalatum urinary antigen is positive in 90% of cases. Mortality without treatment is 80%. Ampho B is the treatment of choice.

Cytomegalovirus Mononucleosis

MC Hall, LK Heath, Marshfield Clinic, Marshfield, WI

We present a case of cytomegalovirus infection in an immunocompetent 30-year-old male who presented to our facility after a three-week illness which began with upper respiratory infections (URI) symptoms. We will also present statistics related to the incidence and prevalence rates for cytomegalovirus infections at a tertiary care center in a rural area. Although the URI symptoms resolved within a few days, fever, chills, headaches, malaise and myalgias continued. The patient was treated for the URI symptoms with antibiotics. Due to continuing symptoms, he presented to an emergency room. At that time he was found to have splenomegaly and mild pancytopenia (WBC 3,300 with 43% lymphocytes, and 10% atypical lymphocytes; hemoglobin 12.4 gm/dL; platelet count 96,000). Abdominal ultrasound confirmed an enlarged spleen size of 16.5 cm by 6.3 cm with a normal echogenic pattern. He subsequently sought care at our institution. On examination, he had a temperature of 97.0, a pulse of 116, and blood pressure of 140/76. He had a tender palpable liver edge 2 cm below the right costal margin and a palpable spleen 3 cm below the left costal margin. No jaundice or scleral icteres were noted. Small anterior cervical nodes were palpable. He became febrile to 103.0 within two hours of admission. Laboratory studies confirmed the lymphocytosis. In addition, liver transaminases were elevated. Additional studies documented previous EBV infection, and a positive urine culture for CMV. Peripheral blood leukocytes were also positive for CMV antigen. In retrospect, the patient's social history was of interest in that he has pre-school age children at home who attended day-care. Children have been documented to disseminate CMV into a family (Yarrish et al. Postgrad Med. 85:251, 1989).

Erysipelothricosis: A Recreational Risk?

Sally J. Holmes, DO, William Yanke, MD, Marshfield Clinic, Marshfield, WI

A 54-year-old female presented with a sudden onset of severe headache, neck and low back pain and "tingling" in the extremities. The patient had otherwise been well, reporting no previous illness or similar symptoms. Histo-

ry told of life on a hobby farm, daily encounters with many animals, and frequent "cuts and scrapes" outdoors. Exam revealed a thin, fit female, ill appearing. Vital signs: T 102, P 110, R 26, BP 105/60. Initial CV exam was normal; within 12 hours of admission the patient developed a new grade 2/6 SEM at the LSB. The patient found to have a small 1-cm lesions on the left index finger and right lower extremity, without erythema. The LS spine was tender and paravertebral muscle spasm was noted. Labs showed a WBC count of 12,700, with 87 segs. ESR was 31. A Chem panel, UA, CXR, ANA and RF serologies, LP, Head CT scan, and LS spine MRI were all normal. A TTE was normal, void of features of valvular vegetation. Two blood cultures returned positive for Erysipilothrix rhusiopathiae, sensitive to penicillin. The patient was empirically treated with nafcillin and gentamicin, but after the above culture results were converted to IV Pen at 112 Mil U per day. The patient defervesced, and symptoms began to fade within two days. She was discharged on the sixth day with plans for one month of therapy for presumptive endocarditis. Erysipelothrix rhusiopathiae is an aerobic of facultatively anaerobic gram- positive rod of the Corynebacteriaceae family. It is widely sensitive to penicillins and resistant to Vancomycin. The agent is a well-recognized pathogen among animals though relatively uncommon in humans except upon occupational exposure. The localized cutaneous presentation, also known as erysipeloid, usually spontaneously remits. Rare septicemia may be associated with erysipeloid but is often accompanied by endocarditis. Long term sequelae may include valvular damage or arthritis.

Paget-Schruetter Syndrome (Effort thrombosis)

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A 53-year-old African-American male presented with swelling and pain in his left upper extremity the night before admission. Doppler ultrasound revealed thrombosis of left axillary and subclavian veins. Anticoagulation therapy was started, and the patient had a good clinical response. Hypercoagulability was ruled out with appropriate studies. The follow-up venography showed large thrombosis in the left axillosubclavian area. After successful thrombolysis, a fixed stenosis in the left subclavian area was found and he was diagnosed with Paget-Schroetter syndrome. He underwent percutaneous transluminal angioplasty (PTA), and the degree of stenosis decreased from 90% to 50%. Patient was continued on oral anticoagulation, and after three months, he underwent a left transaxial first rib resection to decompress the vein. During surgery he was found to have several dense fibrous bands, pressing on axillosubclavian complex. Post surgery, he developed left brachial plexopathy that improved with physical therapy, and he was continued on anticoagulation. He is scheduled for another PTA to resolve the remaining stenosis. Paget-Schroetter syndrome is a rare disorder that occurs predominantly in young patients, especially males, usually after strenuous exercise or activity involving abduction of the upper extremity. Patients often present with sudden onset of pain and swelling of the affected upper extremity. Appropriate treatment is crucial to prevent late morbidities (chronic pain, edema and motor disorders). A staged, multidisciplinary approach consisting of anticoagulation, thrombolytic therapy, surgical decompression of the vein and sometimes PTA (with or without stent placement) appear currently to be the best method of treatment.

Kissing Stents of the Aortoiliac Stenosis

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Background: Aotoiliac atherosclerotic occlusive disease is a major cause of life-style limiting claudication. Traditionally it has been treated with surgical bypass procedure. Percutaneous transluminal angioplasty using kissing balloon plus kissing stent has been used as an alternative to surgery. However, the long-term results are unknown.

Methods: We analyzed our initial experience with simultaneous stents deployment at the aortic bifurcation using kissing stent technique for details of its clinical outcome including effectiveness, complications and long-term outcome.

Result: 18 patients (11 males and 7 females) aged 58+ 13.4 with aortoiliac stenosis underwent kissing stenting. All patients had excellent results and those without other comorbid illness were able to discharge home within 24 hours post stenting. Acute complications include distal emboli in 1 patient, and dissection in 1 patient. The patient who had distal embolization also had left groin infection that required localized debridement. Three patients had restenosis after 7, 20,and 37 months post stenting. However, excellent results were obtained with repeated percutaneous transluminal angioplasty. The initial success rate was 100% and 90% with an average of 12.5 months follow-up in 15 of the 18 cases (3 patients were loss to follow-up).

Conclusion: We have demonstrated in 18 patients that simultaneous deployment of 2 stents at the aortoiliac junction can be done with excellent procedural and clinical success with kissing balloons. Furthermore, it has good long-term outcomes and is associated with few adverse events.

HIV and Lymphoma

Christopher G. Peterson, MD, University of Wisconsin Medical School, Madison, WI

A 42-year-old white male, HIV+ since 1986 with a viral load of 4,900 copies/ml and CD (count of 288/ul) was referred from Janesville, WI for evaluation of erythema and induration along the superior right chest wall with axillary lymphadenopathy. He recalled pulling his arm at work but no other trauma. Despite multiple different antibiotics, the cutaneous lesions progressed to involve the pectoralis muscle, axilla and clavicular region. Multiple cultures, laboratory studies, and two biopsies failed to demonstrate an etiology. A third biopsy revealed anaplastic large cell lymphoma. The patient is currently receiving CHOP chemotherapy and has had great reduction in the

extent of disease, however, problems with neutropenia and peripheral neuropathy required alterations in the patient's chemotherapy regimen. As many as one in six HIV infected people will develop an HIV-related neoplasm. NonHodgkin's Lymphoma (NHI) is now recognized as a common cancer in HIV+ patients, second only to Kaposi's sarcoma in incidence. In fact, it may represent the initial presentation in previously unknown HIV infected patients, or an HIV+ patient AIDS defining illness. The presentation can be quite variable and may be difficult to diagnose. In HIV, 80% of NHL's are systemic rather than nodal, originating most commonly in the central nervous system or GI tract although almost any extranodal site is possible. In contrast to this patient, the vast majorities are clinically aggressive B cell-derived neoplasms exhibiting Burkitt's lymphoma, large cell immunoblastic lymphoma or large cell lymphoma histology. Although prognosis is generally poor, some predictors of survival have been identified.

Cerebral Venous Thrombosis in a Patient with Protein S Deficiency

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A 23-year-old male presented with acute onset of left sided weakness, numbness, blurred vision and occipital headache following minor head trauma. His past history was significant for Protein S deficiency for which he was on warfarin. Physical examination revealed limited left lateral gaze, left facial weakness, tongue deviation to the right, decreased sensation, dense motor weakness and a Babinski on the left. Investigations were significant for INR of 2.36 and Factor V Leiden mutation. Magnetic Resonance Imaging of the brain showed decreased signal intensity in the right sigmoid and transverse sinus. The patient was treated with Heparin with dramatic improvement within hours and complete neurologic recovery in 72 hours.

Discussion: Cerebral venous thrombosis can be caused by a wide variety of intracranial and systemic causes, has an extremely wide spectrum of clinical presentation and unpredictable course, thus presenting a challenge for the clinician. Combination of MRI and MRA is the best noninvasive method for the diagnosis and follow-up of cerebral venous thrombosis. CVT is far more common than was previously assumed. Treatment of CVT with Heparin is associated with good results and its benefit exceeds the risk of hemorrhage. The outcome is usually favorable. This clinical vignette emphasizes that CVT should be considered in the appropriate clinical setting.

Lymphoma Presenting as a Pancoast Tumor

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A 60-year-old man presented to the hospital with weight loss, right shoulder pain, lower extremity weakness and acute retention of urine admission. He noted that his left eye had been "popping out" for a few days before presentation. He was a plumber and had never smoked. The rest of the medical, social and personal history was unremarkable. On exam, he had right eye ptosis, anhidrosis and miosis consistent with Homer's syndrome. He also had a ulnar nerve palsy on the right side and bilateral lower extremity weakness and upgoing plantars. He had decreased sensations in the C7-T4 dermatomes. He had a right upper lung dullness and increased vocal and tactile fremitus. Imaging studies were done which showed a right upper lung mass extending into, and compressing the thoracic spine and splenic mass. The patient had emergent radiation therapy and IV steroids. A needle biopsy of the lung mass was obtained. Preliminary biopsy suggested mixed small cleaved and large cell lymphoma, which was confirmed by flow cytometry. The patient underwent emergent radiation therapy and was begun on CHOP chemotherapy and had a significant clinical improvement.

Discussion: Pancoast tumor is a generic term applied to upper lung lobe infiltrates which invade tissue planes and involve the cervical sympathetic chain with/without the brachial plexus. The most often cause is lung cancer. Uncommon tumors including metastatic tumors, lymphoma and occasionally infections have been known to cause a similar picture. Lymphoma is a very rare cause of Pancoast tumor. Five cases have been reported so far.

An Unusual Cause of Low Back Pain

Nasia Safdar, MD, University of Wisconsin Medical School, Madison, WI

A 23-year-old Somali female presented with a nine-month history of progressively increasing severe low back pain, which was exacerbated by movement and radiated down the medial aspect of the right hip. She had also noticed difficulty walking upright secondary to pain in her right groin. She had not noted fevers, chills, night sweats, weight loss, lower extremity weakness or urinary retention. On physical examination, she had a temperature of 99.5 degrees and was hemodynamically stable. There was no evidence of lymphadenopathy. Examination of her back revealed percussion tenderness on the spine over the L4-L5 region. She was unable to extend her right hip because of pain. There was decreased sensation to pinprick over the medial aspect of her right leg. A smooth 5-cm x 5-cm nontender mass was noted in the abdomen. No hepatospenomegaly was noted. Her lungs were clear. X-rays of the spine revealed a destructive process involving vertebral bodies L3-L5. CAT scan of the abdomen showed large loculated fluid collections localized over the psoas muscles bilaterally and a fluid collection adjacent to L3-L5 vertebral bodies. MRI of the lumbar spine revealed an epidural abscess with L3-L4 neural foramina stenosis. A TB skin test measured 10-15 mm. Chest x-ray was normal. ESR was 48 mm/hr.

Needle aspiration of her right groin mass grew mycobacterium tuberculosis. She was started on Isoniazid, Rifampin, Pyrazinamide and Ethambutol and continued to improve.

Extrapulmonary manifestations of tuberculosis have become increasingly rare in the United States. Spinal tuberculosis or Potts disease usually invade the thoracic spine with involvement of adjacent vertebral bodies. TB in the lower spine may present as a psoas abscess. The disease responds well to chemotherapy, and the patient

should be followed closely for evidence of neurologic compromise.

Guillai-Barre Syndrome and the Miller Fisher Variant

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Patient is a 52-year-old white male who presented to our institution with a five day history of increasing fatigue associated with arm weakness, perioral numbness and progressive ptosis. On the day of admission he needed to hold his eyelids up manually, and he developed ataxia. He denied recent upper respiratory symptoms, diarrhea, and he did not receive the flu shot this year. His past history is significant for Type II diabetes mellitus, hypertension, obesity, low back pain and two cerebral vascular accidents 10 years ago without residual. His exam revealed a BP 198/98, and he was afebrile. His voice was hoarse and right extraocular movements were limited and sluggish compared to the left. Reflexes were absent. A tensilon test was negative. Lumbar puncture revealed no RBCs, one WBC, glucose of 124, and an elevated protein of 90. EMG confirmed an acute demylinating process. Stool was negative for enteropathogens and Botulism toxin. Urine was negative for heavy metals and porphyrins. A GQlb ganglioside autoantibody was present in his serum. This confirmed our diagnosis of Miller Fisher Syndrome.

Discussion: Miller Fisher syndrome is a variant of Guillain-Barre Syndrome involving the triad: ataxia, ophthalmoplegia, and areflexia. The pathophysiology of the syndrome can be explained through GQlb ganglioside autoantibodies, which are seen in 96% of cases of Miller Fisher Syndrome. These autoantibodies recognize epitopes expressed specifically in the nodal regions of oculomotor nerves and cerebellar neurons. Organisms such as Mycoplasma Pneumoniae and Campylobacter jejuni contain cell walls that are capable of inducing the production of these antoantibodies. Treatment is thus involved in immune modulation, through the use of IVIg, plasma exchange, and steroids. Our patient required intubation and wan treated with all three modalities over a three-month hospitalization. He eventually recovered to be discharged to long term rehabilitation.

Spontaneous Dissection of the Intracranial Internal Carotid Artery in a Young Adult

Geetha N. Varma, MD, Anthony A. Otters, MD, Department of Internal Medicine, Sinai Samaritan Medical Center, Milwaukee, WI

Dissection of the internal carotid artery (ICA) has become an increasingly recognized cause of stroke in young adults. The incidence is 10-20% in those with ischemic stroke. The most common site of involvement is the cervical ICA. It rarely involves the intracranial segment of ICA.

A 31-year-old female with type II diabetes mellitis presented with right-sided weakness. She had developed a similar weakness two months prior to this. Her symptoms were improving slowly, when they recurred on the same side. She denied any history of trauma. Clinical examination confirmed right-sided hemiplegia. The MRI of the head revealed right frontal infarct and was also suggestive of intracranial ICA dissection. The magnetic resonance angiogram (MRA) and angiography of carotid arteries performed earlier were re-evaluated at this time. The diagnosis of dissection of the intracranial (supraclinoid segment) ICA was confirmed. The patient was started on coumudin. When her symptoms improved, the medication was changed to aspirin.

Discussion: Intracranial ICA dissection is rare; there are very few reported cases. Etiologies include trauma, hypertension, Marfans syndrome, fibromuscular dysplasia, and cystic medial necrosis. Intracranial and extracranial carotid dissections differ in their clinical outcome an pathophysiology. With a mortality rate of 75%, intracranial dissection is significantly more catastrophic. Although the gold standard for diagnosing dissection is angiography, MRA is sensitive and specific enough for diagnosis. Anticoagulants are recommended for the initial treatment of ICA dissection. Awareness of the clinical possibility of this entity and aggressive evaluation are of paramount importance in the early diagnosis and effective treatment of this disease.

Undiagnosed Thyrotoxicosis in Presence of Other Medical Problems

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A 41-year-old female with history of multiple sclerosis, rheumatoid arthritis, neurogenic bladder and muscle wasting and hyperreflexia and joint deformity secondary to her multiple sclerosis and rheumatoid arthritis came to ER for blood in the urine. While in the ER she was noted to have a heart rate in the 180s and was supraventricular tachycardia. Subsequent history and physical reveals patient's normal heart rate was 140, approximately 30 pound weight loss in past three months despite strong appetite, severe heat intolerance, depression, anxiety, exophthalmos, hyperreflexia, lid lag, tremor—all classic signs and symptoms of thyrotoxicosis. This is her third hospitalization in six months, which included neurological evaluations for tremors and hyperreflexia thought to be due to complications of multiple sclerosis, pulmonary embolism evaluation for persistent tachycardia and anxiety and depression thought to be due to her debilitation and other social situations like divorce. Classic full-blown thyrotoxicosis is generally made by history and physical exam. These findings would include nervousness, fatigue, palpitations, exertional dyspnea, weight loss, heat intolerance, irritability, tremor, muscle weakness, decreased menstrual flow in women, sleep disturbance, increased perspiration, change in appetite, photophobia and diplopia. This case report describes how classic findings of thyrotoxicosis were missed over many months in the presence of other chronic medical conditions. In conclusion, hyperthyroidism is a great masquerader presenting as various other medical conditions. Unless the clinician

suspects the diagnosis or is looking for the disease, the disease may be missed despite obvious signs and symptoms in the presence of other chronic medical illnesses.

Rocky Mountain Spotted Fever: A Classic Case Presentation

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A 42-year-old white male presented with one week of lymphadenopathy, chills, myalgia, fatigue and frontal headache; and three days of persistent fever, dyspnea and a dry cough. One day of a diffuse erythematous rash. His examination was remarkable for fever, lympadenopathy and a diffuse erythematous maculopapular rash. He had recently traveled to Oklahoma and was bitten by a wood tick. Laboratory evaluation revealed mild anemia an positive convalescent antibodies to Rickettsia rickettsii by IFA. He was treated with doxycycline and defervesced within 48 hours.

Discussion: Rocky Mountain Spotted Fever (RMSF) was first described in the Rocky Mountains but is now most prevalent in the South Atlantic Coastal, western and south central states. There are 600-1,200 cases per year report in the United States. The pathogen is Rickettsia rickettsii and its vectors are the wood tick, *Dermacantor andersoni* and the dog tick, *Dermacantor variabilis.* The organism causes a vasculitis process. Sixty percent to 70% of cases present with the classic triad of fever, a characteristic rash and tick exposure. Other findings include abnormalities in the respiratory, GI, hematologic, neurologic, renal, and cardiac systems. Laboratory findings are usually normal but may have hyponatremia, leukopenia, thrombocytopenia and abnormal liver function tests. Diagnosis is made clinically and confirmed retrospectively with acute and convalescent antibodies to Rickettsia rickettsii. Mortality is high in untreated cases and death is usually secondary to pulmonary edema, myocarditis, DIC and other organ failure. With prompt treatment, the mortality rate decreases to 3% to 5% and recovery usually takes several weeks. Treatment of choice is doxycycline and supportive care.

Secondary Prevention of Coronary Artery Disease at a Community Multi-specialty Medical Center

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Background: There is convincing evidence in the literature that the secondary prevention of coronary artery disease is effective in decreasing morbidity and mortality. However, numerous studies indicate that patients are sub-optimally managed.

Purpose: To assess how well patients at a community multi-specialty medical center are meeting coronary artery disease secondary prevention guidelines.

Methods: By retrospective database review, patients hospitalized in a one-year period at our institution for myocardial infarction, angioplasty, or coronary artery bypass grafting were identified. Of these patients, those who had their primary follow-up for coronary artery disease at the above-mentioned medical center were selected. Three hundred forty-eight patients were identified. The following data were collected from the last clinic visit and the last LDL cholesterol obtained in the year after hospitalization: smoking status, aspirin use, beta-blocker use, blood pressure and LDL cholesterol.

Results: Eighty-five percent of patients were nonsmokers. Of patients who previously smoked, 47% had stopped. Of patients without contraindications, 93% were taking aspirin. Of patients without contraindications, 88% were taking beta-blockers after myocardial infarction. Sixty-six percent of patients had blood pressures less than or equal to 140/90. Thirty-six percent of patients had LDL cholesterol levels less than or equal to 100.

Conclusions: Although there is much room for improvement, this institution is doing as well as or better than other reports in the literature. The area in need of most improvement is the lowering of LDL cholesterol.

Spinal Epidural Abscess

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A 44-year-old white male presented with fever, low back pain, lower extremity weakness and difficulty urine. He had been seen in the emergency department one month prior with back pain. During the ensuing two weeks his pain intensified and was followed by weakness and bladder dysfunction. He had previously been in good health. On admission he was noted to have a fever of 102.2F, loss of proprioception, decreased sensation and motor weakness in the lower extremities. Laboratory data revealed a WBC of 15.6 K/UL and ESR of 112 mm/hr. The blood cultures were positive for coagulase positive cocci. MRI of the thoracic spine demonstrated an epidural abscess with destruction of the T-11 to T-12 vertebral bodies and cord compression. Administration of broad-spectrum antibiotic agents was begun and adjusted when cultures identified *Staph. aureus*. Emergent spinal decompression was performed with cultures confirming Staph. aureus infection. Spinal fusion was also done and as soon as the patient's condition was stable, physical therapy was begun. On three-month follow-ups he regained limited ambulating ability.

Discussion: A spinal epidural abscess is an uncommon condition with an estimated incidence of 0.2-2.0/10000 hospital admissions. This serious infection results from direct extension of a local process or hematogenous spread from an antecedent or ongoing distant focus of infection. The most common organism cultured is *Staph. aureus.* The neurologic symptoms result from mechanical cord compression by the abscess mass. The thoracic spine is the site of the abscess in 50%-80% of patients. The findings of back pain, tenderness and fever should suggest the diagnosis, and the appearance of weakness and loss of sensation below the area of pain should be considered as

the strongest possible clinical confirmation. In cases in which this constellation of findings occurs, rapid evaluation and immediate surgical decompression and drainage offers the patient a possible successful functional recovery. The extent and location of an abscess are best visualized using MRI. Multi planar imaging and visualization of the soft tissues including the spinal cord, para spinal musculature and the disc confer a distinct advantage of MRI over CT and Myelography. Mortality associated with a spinal epidural abscess has ranged from 6.9%-23% in studies conducted during the past two decades. It has been well documented that the degree of recovery is closely related to early diagnosis and intervention and to the extent of a neurological deficit at the time of diagnosis.

The Patient with Neurosyphilis

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A 61-year-old Laotian male was admitted with a three-month history of mental status changes consisting mainly of auditory hallucinations, confusion and paranoid behavior. The patient had no physical complaints, recent illness or new medications. The physical exam revealed a blunted affect and disheveled appearance as well as the absence of typical signs of late-stage syphilis. Further analysis showed seropositivity for VDRL and MHA-TP antibodies, CSF that was VDRI positive with elevated protein, and a normal CT scan. The patient was treated with intravenous aqueous PCN G, however, most of the patient's symptoms persisted, exemplifying how difficult neurosyphilis can be to treat.

Discussion: Neurosyphilis was a more common diagnosis prior to the advent of penicillin, but can still be seen by today's clinicians. It is the natural course of untreated primary and secondary syphilis, a well-known sexually transmitted disease. The diagnostic criterion can be as varied as the clinical presentations of neurological dysfunction, but a definative diagnosis requires the presence of Trepnema pallidum antibodies in the serum. Ear and eye manifestations are frequent and usually asymmetric. The treatment is aqueous penicillin but often requires repeat courses.

A Renal Transplant Patient with Fever

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A 45-year-old diabetic man with a history of renal transplant 16 years prior to admission presented with 3 weeks of fever, fatigue, nausea and headache. On physical exam, he had a low-grade fever, no nuchal rigidity, mild abdominal tenderness and erythematous papules on both arms. Laboratory analysis showed normal WBC count and renal function. Chest x-ray and head CT were within normal limits. Spinal fluid analysis revealed a WBC count of 20 cells/mm3 and a lymphocytic pleocytosis. Diagnosis of disseminated cryptococcosis was made based on identification of cryptococcal antigen in spinal fluid, serum, and urine. Fungal culture confirmed the presence of *Cryptococcus neoformans.* The patient was treated with Amphotericin B and Flucytosine with resolution of symptoms and decreasing cryptococcal antigen titers in spinal fluid. Cryptococcosis is a disease caused by the encapsulated yeast-like fungus *Cryptococcus neoformans*. The organism exists in soil and is present worldwide. Infection is acquired by inhalation of the unencapsulated yeast. Pulmonary cryptococcosis is rarely symptomatic and is usually a self-limiting disease in immunocompetent individuals. In patients with T-cell dysfunction there may be post primary dissemination with seeding of CNS, skin, eyes, urinary tract and bones. Clinical manifestations of disseminated cryptococcosis are insidious and include headache, fever, nausea, cough, dyspnea, arthralgias, and skin lesions. One third of patients with disseminated infection have abnormal chest x-rays. As in this case, lumbar puncture is key to making the diagnosis. Organisms are detected from spinal fluid by India ink examination, by assay for cryptococcal capsular polysaccharide or by culture. The disease is fatal if not treated. Amphotericin B is the treatment of choice, which may be given in conjunction with Flucytosine for synergy.

A Case Presentation of Hemophagocytic Syndrome

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While visiting family in Arizona, a 74-year-old white male was found to have mild pancytopenia during a hospitalization for a transient ischemic attack. Upon returning home to a small town in Wisconsin he developed fever, maculopapular rash and pulmonary edema. During that presentation he was found to have evidence of liver dysfunction, hypoalbuminemia and persistent pancytopenia. Due to hypotension and worsening respiratory status, the patient was transferred to our institution and was placed on mechanical ventilation. After a transesophageal echocardiogram ruled out a cardiac etiology for the patient's hypotension and pulmonary edema, a hematology consult was obtained for evaluation of worsening pancytopenia. A bone marrow biopsy revealed hemophagocytosis. The diagnosis of hemophagocytic syndrome was made. Serological testing for any infection known to be associated with hemophagocytic syndrome was negative. The patient received cyclosporine and G-CSF with almost complete resolution of his pancytopenia. Unfortunately, the patient had already developed severe, irreversible hepatic failure, which led to his death. Hemophagocytic syndrome should be considered in a patient with fever, hepatosplenomegaly and pancytopenia. A description of hemophagocytic syndrome as well as options for treatment will be discussed.

Acute Eosinophilic Myocarditis and the Idiopathic Hypereosinophilic Syndrome

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A 61-year-old woman with newly diagnosed hypereosinophilic syndrome (IES) and known skin and lung involvement presented to the emergency department complaining

of severe chest pain. She had electrocardiogram changes suggestive of a possible inferior myocardial infarction and troponin-I of 93.4. She had normal coronary arteries on catheterization, but a new global hypokinesis with an ejection fraction of 35% and new mitral regurgitation of echocardiogram. On right ventricular biopsy, the myocardium was infiltrated with eosinophils and lymphocytes and had extensive necrosis. The patient had a difficult clinical course with profound hemodynamic instability and recalcitrant atrial and ventricular tachyarrythmias requiring defibrillation, balloon pump support, antiarrhythmic therapy, pacing and inotropic support. She had a long recovery and was discharged to home.

Discussion: Idiopathic HES has three defining features: first, the patient must have sustained blood eosinophilia of greater than 1,500/~tL present for longer than six months; second, other etiologies for eosinophilia must be explored and excluded; lastly, the patient must have evidence of organ involvement. The cardiovascular system is the organ system most frequently involved and is the cause of significant morbidity and mortality. Myocardial damage in HES is generally insidious and progresses through three stages: an acute necrotic stage, a thrombotic stage, and finally a fibrotic stage. Most commonly, the early necrotic stage is unrecognized clinically and patients present in the later thrombotic and fibrotic stages. There have been, however, a number of case reports of patients presenting with acute eosinophilic myocarditis as a feature of HES. This case illustrates that a patient with fulminant eosinophilic myocarditis can survive with a good clinical outcome.

The Case of the "Jumpy" Patient

Kurt C. Kamper, MD, Marshfield Clinic/St. Joseph's Hospital, Marshfield, WI

A 37-year-old man with no significant past medical history presented to the residents' clinic with several complaints. His symptoms began approximately 3 to 4 months prior to evaluation with increasing fatigue. He subsequently experienced a febrile illness lasting 3 to 4 days, during which he was noted to have liver function test abnormalities as well as mild leukopenia and thrombocytopenia. In the ensuing months, he developed a Bell's palsy, mid thoracic back pain and an exaggerated startle response to external stimuli. This increased startle reaction began subtlety, but increase in both frequency and severity with time. Physical exam was noted for a left facial nerve palsy, subtle 4+/5 weakness in the left lower extremity, and extensor response to plantar stroking on the left and occasional total body jerking with some physical maneuvers. Laboratory studies included a normal CBC, electrolytes, liver function tests, EKG, and chest X-ray. Lumbar puncture was performed with demonstrated a lymphocytosis (280 white cells with 89% lymphocytes) mildly elevated protein (59mg/dl) and normal glucose. CSF culture was positive for *Borrelia burgdorferi.* CNS Lyme disease, or neuroborreliosis, can have a varied clinical presentation. I will discuss the unique aspects of this patient's case, most notably the reflex-type myoclonus he experienced, as well as provide an overview of the disease and treatment.

HSV Encephalitis Presenting as Hyperosmolar Nonkeotic Syndrome

John G. McCartney, MD, University of Wisconsin Medical School, Madison, WI

A 42-year-old male presented with altered mental status. He had felt poorly for several days with nausea, vomiting, mild confusion and increasing lethargy. There was no evidence of trauma or illicit substance use. His mother, believing her son was experiencing an insulin reaction, administered juice, candy and several donuts without improvement. Upon EMS arrival, he was given one ampule of dextrose without change. Patient's past medical history is significant for diabetes mellitus type 1 with associated neuropathy and nephropathy, hypertension, hyperlipidemia and depression. His only medication on admission was insulin. Patient is divorced, lives alone and is a two pack per day tobacco user with no known drug or alcohol use. On exam, he was afebrile and hemodynamically stable. His exam was non-focal, with no evidence of trauma. He was somnolent, confused and oriented only to person, demonstrating normal strength in all four extremities, symmetric reflexes and intact cranial nerves. Initial blood sugar was 2792, with negative ketones. Head CT demonstrated a questionable ischemic area in the left temporal region. Lumbar puncture revealed I RBC and 1 WBC with 60% lymphocytes and 40% monocytes. Culture, gram stain, cryptococcal antigen and acid-fast stain were all negative. Blood sugars responded to hydration and insulin. NM demonstrated increased signal intensity in the temporal lobes bilaterally and right frontal lobe hemorrhage. Herpes simplex virus (HSV) PCR from his original cerebrospinal fluid was positive for HSV type 2, and intravenous acyclovir was initiated. HSV, a common cause of encephalitis, typically is associated with altered consciousness, with or without signs of meningeal irritation. This presentation with extreme hyperglycemia, complicated the neurologic evaluation. CSF typically demonstrates pleocytosis. HSV type 2 is present in a minority of cases, with type I demonstrating higher incidence. Comorbidity, advanced age and severe mental status decline negatively impact prognosis.

What A Headache!

K Stefanovic, MD, N. Guda, MD, J. Brooks, MD, Sinai Samaritan Medical Center, Milwaukee, WI

Learning Objective: Ingestion of even small doses of Minoxidil can cause profound hypotension in normotensive individuals. Non specific EKG changes and sometimes precipitation of an unstable coronary syndrome may also be seen.

A 22-year-old healthy African-American male inadvertently took five pills of minoxidil, 10mgs each, which belonged to another family member, since he had a severe headache. His headache resolved but he developed

severe nausea and vomiting in about 3 hours and presented to the emergency department. He was noted to have a BP of 70/50 with a pulse of 110/min. His physical exam was normal and laboratory data revealed a creatinine of 2.4. EKG showed a global 2mm ST depression. His first set of cardiac enzymes was negative, which later peaked at CK 977, CK-MB 20.1, Myoglobin 168, Troponin 15.2. He was initially managed with fluids and small doses of dopamine. He developed pulmonary edema. Findings on pulmonary artery catheterization were consistent with arteriolar vasodilation. ZD Echo was normal. With adequate support including discontinuation of dopamine and infusion with phenylephrine, he recovered completely.

Discussion: Minoxidil is a potent arteriolar vasodilator with little or no effects on the venous system. Adverse effects include hypotension, reflex tachycardia, precipitation of angina and rarely non-Q wave MI. Hypotension with minoxidil can be reversed with dopamine, vasopressin, phenylephrine and angiotensinII. Since both dopamine and minoxidil cause reflex tachycardia including precipitation of unstable coronary syndromes, some authors suggest phenylephrine might be a better choice.

Dementia in Cobalamin Deficiency

M. Mouanoutoua, S. Vanikuti, Department of Medicine, Sinai Samantan Medical Center, Milwaukee, WI.

A 75-year-old African-American male was brought to the hospital by a friend with a 6-month history of progressive weakness, falls, forgetfulness, dyspnea on exertion and bilateral lower extremity edema. Physical examination was significant for severe pallor, icterus, bilateral basilar rales and pitting edema. Neurological exam revealed ataxic gait, impaired position and vibration senses plus a mini-mental exam suggesting of a severe global dementia. Initial lab values revealed HGB 2.7 gm/dl, MCV 119, WBC 2900, and PLT 20K. Peripheral smear showed hypersegmented neutrophils. The serum LDH was 6443 and total bilirubin of 2.7. Further workup revealed a Cobalamin level of 64 pg/ml (211-911), Homocysteine 156 micromol/l (4.9-14.6), Methylmalonic acid 105 umol/l (<0.41), with normal folate and ferritin level. Anti-Intrinsic Factor was positive. A diagnosis of pernicious anemia was made. Patient was started on 1 mg Vit. B 12 IM QD x 5 days, then 1 mg every week x 5 weeks as recommended by Teunisse et al. Surprisingly, the patient showed a drastic and full recovery from his initial neurological deficits, and a repeated mini-mental exam at three weeks post the initiation of Vitamin B 12 therapy showed a score of 30. Vitamin B12 deficiency can lead to multiple neurologic findings including dementia. Three prospective studies did not show any improvement with Cobalamin therapy in patients who had dementia and low Vit. B12 level. One retrospective study, however, supported the existence of reversible dementia from Cobalamin deficiency. We speculate that the reversibility of dementia in this patient could be due to the initiation of treatment prior to irreversible insult that occurred to the brain.

My Legs Hurt; I Think I Have Cancer

Susan A Kamper, MD, Marshfield Clinic/ St. Joseph's Hospital, Marshfield, WI

Hypertrophic pulmonary osteoarthropathy (HPOA) is most often associated with bronchogenic carcinoma. The syndrome consists of symmetric proliferating subperiosteal osteitis with subperiosteal new bone formation. The long tubular bones are most commonly involved. Arthralgias, limited range of motion, tenderness on palpation and severe leg edema can be noted. A 62-year-old Caucasian female with previous right upper lobectomy for adenocarcinoma in 1993, and wedge resection of a RLL mixed large cell neuroendocrine and adenocarcinoma in June 1998, presented with worsening digital clubbing, increased severe pain below her knees for three months, distal lower extremity edema for about one week, low-grade fever to 100 degrees and cough productive of thick, white sputum. Physical exam was positive for digital clubbing of both upper and lower extremities, proximal nailbed sponginess, 1+ pitting edema to the knees on the left, 1+ on the right, and significant tenderness over the distal lower extremities. Initial studies revealed a right hilar mass by CT and an FDG scan was positive for abnormal uptake in the right hilar and suprahilar region, consistent with metastatic disease. Plain x-rays of the lower legs showed periostitis. Bone scan showed increased patchy cortical activity in the lower extremities. The patient did not tolerate indomethacin. She was subsequently treated with Pamidronate. The severe, disabling pain associated with HPOA is not always responsive to conventional treatment with NSAIDs. Pamidronate has been reported to be effective therapy for pain in HPOA.

Michael J. Dunn, MD

Dean's Corner

MCW Building on its Commitment to Genetic Research

by Michael J. Dunn, MD, Dean and Executive Vice President, Medical College of Wisconsin

The mainstream media have saturated the public with the news that the sequencing of the human genome is now nearly complete. To their credit, they have brought the double helix out of biology textbooks and into popular awareness. The more astute reports emphasize that mapping our genes is merely the first step; figuring out what each gene does is the next step – and this step will transform the practice of medicine. Five years from now, treatment regimens from even the early 1990s will probably seem archaic.

I am pleased that the Medical College of Wisconsin is already on the front lines of functional genomics. Our efforts are focused on identifying the role specific genes play in cell function. This research is critical to translating the basic map of the human genome into therapies tailored to each patient.

Five years ago, we identified genetics as a key component of the Medical College's strategic plan. We recognized that an overwhelming number of new beginnings in diagnosis and treatment have the potential to occur here in the 21st century. We have consequently committed significant resources to developing laboratory space and supporting and attracting genetic researchers.

Most adult clinical conditions are considered to be polygenic in origin. The genetic basis of diabetes mellitus, cancer, hypertension, obesity and other prevalent disorders is complex and cannot be explained by the abnormality of a single gene. Research initiatives at the Medical College are taking aim at these conditions.

Our Human and Molecular Genetics Center, under the leadership of Howard Jacob, PhD, involves faculty from many disciplines. Doctor Jacob, the Warren P. Knowles Professor of Human and Molecular Genetics, was part of the team that developed the complete genetic map of the rat. He is exploring links between the genes that give rise to hypertension, diabetes and kidney disease in rats and humans.

Allen Cowley Jr., PhD, Chairman and Professor of Physiology, along with Theodore Kotchen, MD, Chairman and Professor of Medicine, are leading efforts to establish the genetic basis for hypertension. Their studies also involve data gathered from rats, which are inbred for hypertension, and from humans.

Within the last 15 months, several additions to our pediatrics faculty have further strengthened our Genetics Center team. Soumitra Ghosh, MD, PhD, came to the Medical College last summer from the Human Genome Research Institute of the National Institutes of Health. A leading researcher in the genetics of diabetes, Dr. Ghosh is Associate Professor of Pediatrics and directs the new Max McGee Juvenile Diabetes Research Center. The Max McGee Center's clinical services are based at Children's Hospital of Wisconsin while its research facilities are in the Medical College's Health Research Center building.

We are very pleased to welcome Sun-Wei Guo, PhD, Professor of Pediatrics, who came from the University of Minnesota. He is one of the leading statistical geneticists in the world. Doctor Guo uses mathematical models to probe the interaction between genes and the environment. This analysis goes beyond simply identifying gene mutations and can provide more realistic mechanisms for the development of diseases, including cancer.

William Rhead, MD, PhD, Professor of Pediatrics, is newly arrived from the University of Iowa. He directs the Genetics Center at Children's Hospital. His research evaluates the causes of inborn errors in human metabolism and potential treatments for prolidase and glutathione synthetase deficiencies.

Ahmed Kissebah, MD, PhD, Professor of Medicine and Chief of the Division of Endocrinology, Metabolism and Clinical Nutrition, is part of an interna-

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Kalisa B. Barratt, JD

Office of the General Counsel

Peer Review Records May be Discoverable in Federal Court

by Kalisa Barratt, JD, von Briesen, Purtell & Roper, s.c., Milwaukee

A recent federal court decision from the Eastern District of Wisconsin has brought the protections afforded to records of peer review activities into the spotlight. The case, *Patt v. Family Health Systems, Inc.*, focused on whether a federal court would apply the Wisconsin peer review statute and provide protection from discovery to certain records. Unfortunately, but not surprisingly, it declined to protect the records, holding that federal common law did not recognize a peer review privilege. However, the case has narrow application, and physicians should not fear that all peer review records will be discoverable in federal court. Following is an explanation of the case and an analysis of its effect on the discoverability of peer review in federal court.

Facts

Doctor Anita Patt sued Family Health Plan for alleged violations of her civil rights by subjecting her to gender-based disparate treatment and hostile work environment. Patt accused her former supervisor of being the principal source of gender-based disparate treatment. She was the only woman in the general surgery department, and she claimed that as a result of this she was treated differently than her male counterparts. Patt claimed, among other things, that some of her male colleagues were asked to provide a list of procedures in which they had assisted Patt. Her employer allegedly later used this list to attack her competencies. In addition, she claimed that the administrative secretary of the health care plan was asked to look for gaps in Patt's surgery schedule to later be used to prove that she took unauthorized time off. Also, Patt claimed her employer unjustifiably challenged her for overtime payments.

The employer argued that Patt's treatment was based on legitimate and nondiscriminatory reasons, and that the employer took immediate remedial steps when it learned of the alleged harassment by Patt's former supervisor. To support its defense, the employer provided the court with memorandums that reflected on Patt's professional demeanor and patient care, and the files of Patt's cases submitted for peer review. However, the employer asked the court to prevent Patt from accessing documents relating to the evaluation and discipline of the male members of the surgery department's because those documents constituted confidential information under Wisconsin's peer review law.

State versus Federal Law

The court first opined that evidentiary privileges, such as that found in Wisconsin law protecting discovery of peer review records, exclude relevant evidence and thereby block judicial fact-finding. As such, privileges are not favored by the courts and will be narrowly construed when they exist.
The court was then required to determine whether to apply the Wisconsin privilege in this case. Generally, federal courts will only apply state laws if the federal court is hearing a case that is controlled by state law, as further explained below. Patt filed her case in federal court because her claim rested on a federal law, Title VII of the Civil Rights Act of 1964. Because of this, the federal court held it was not bound to follow state law. It therefore declined to apply Wisconsin's peer review statute.

However, the next step in the court's analysis was whether it should recognize a federal peer review privilege. (Courts from other jurisdictions had already held that no federal common law i.e., non-statutory peer review privilege exists.) To assist it in determining whether it should recognize a federal peer review privilege, the court looked to the only federal law that specifically addressed peer review, the Health Care Quality Improvement Act (HCQIA). The court noted that in

The author wishes to acknowledge von Briesen, Purtell & Roper, s.c., Summer Associate Galo I. Vargas' assistance in the preparation of this article.

enacting HCQIA protections, Congress only provided protections to participants in peer review, but no such protections were afforded to protect peer review records and materials. The court held that the absence of such protections indicated that Congress did not intend to protect these records. Moreover, HCQIA's protections are not absolute. Congress specifically denied HCQIA immunity in Civil Rights and certain other cases. According to the court, this showed that Congress deemed it more important to vindicate civil rights violations than to keep peer review confidential. Based upon this Congressional intent, the court held that it would not create a federal peer review privilege.

What This Case Means

Physicians should not view this case as a reason not to participate in the peer review process. This case certainly does not mean that every time peer review records are subpoenaed in a federal court they will be discoverable. Discoverability will be based on the nature of the case.

When a federal court is deciding issues based in state law, such as most malpractice cases, it should continue to apply the peer review statute. A medical malpractice claim would be tried in a Wisconsin state court if the plaintiff and defendant were from Wisconsin. However, a medical malpractice lawsuit could be tried in federal court if the federal court had jurisdiction based upon diversity of the parties; in other words, if either the plaintiff or the defendant lived in Wisconsin and the opposing party lived in a different state. In addition, the amount in controversy must be greater than $75,000. In such a case, the federal court would be required to apply the law of the state where the injury occurred. Wisconsin's peer review statutes would therefore normally apply to claims of malpractice that occurred in Wisconsin.

Another example of a medical malpractice lawsuit that could be tried in federal court is one where all of the parties involved in the lawsuit resided in Wisconsin, but the lawsuit also contained a federal issue such as a civil rights claim, e.g., racial discrimination. In a case of this nature, the federal court would try the medical malpractice action only if it arose from the same operative facts as the civil rights claim. If not, the federal court would dismiss the medical malpractice action (for lack of jurisdiction) and would try only the racial discrimination claim. An example of a situation where a medical malpractice and a racial discrimination claim could arise from the same set of operative facts is an incident where a patient suffered an injury because he was refused treatment based upon race.

The *Patt* case only presented the court with a federal question. Therefore, the court applied federal and not state law. Once the court held no federal common law peer review privilege existed, the records were not protected.

Conclusion

While the result of this case is not surprising given other similar federal court decisions across the country, it is nonetheless significant. However, physicians should understand that discoverability of peer review records under the *Patt* decision will occur only under somewhat narrow circumstances. Absent a federal court handling a matter involving state diversity of the parties, or a case that presents a federal question, Wisconsin law should continue to be applied by federal courts and peer review records should be protected from discovery.

MCW Commits to Genetic Research

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tional team scanning the human genome for the genes that control obesity.

Maureen Neitz, PhD, Professor of Ophthalmology, and Jay Neitz, PhD, Associate Professor of Cell Biology, Neurobiology and Anatomy, have developed a genetic test for color blindness. They are leveraging this work to probe the genetic basis of macular degeneration.

To provide real benefits to patients, genetics research must make the leap from bench to bedside. We also want to establish more clinical genetics research by collecting DNA from patients, with their permission, and analyzing that DNA for mutations that predispose specific diseases. We are already doing this in congenital heart disease in children, obesity in adults and hypertension in adults.

I look forward to keeping you informed of our progress at the Medical College of Wisconsin and welcome your thoughts on applying our ever-expanding knowledge to improve the lives of our patients.

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ATTN: Terri Weaver
P.O. Box 1109
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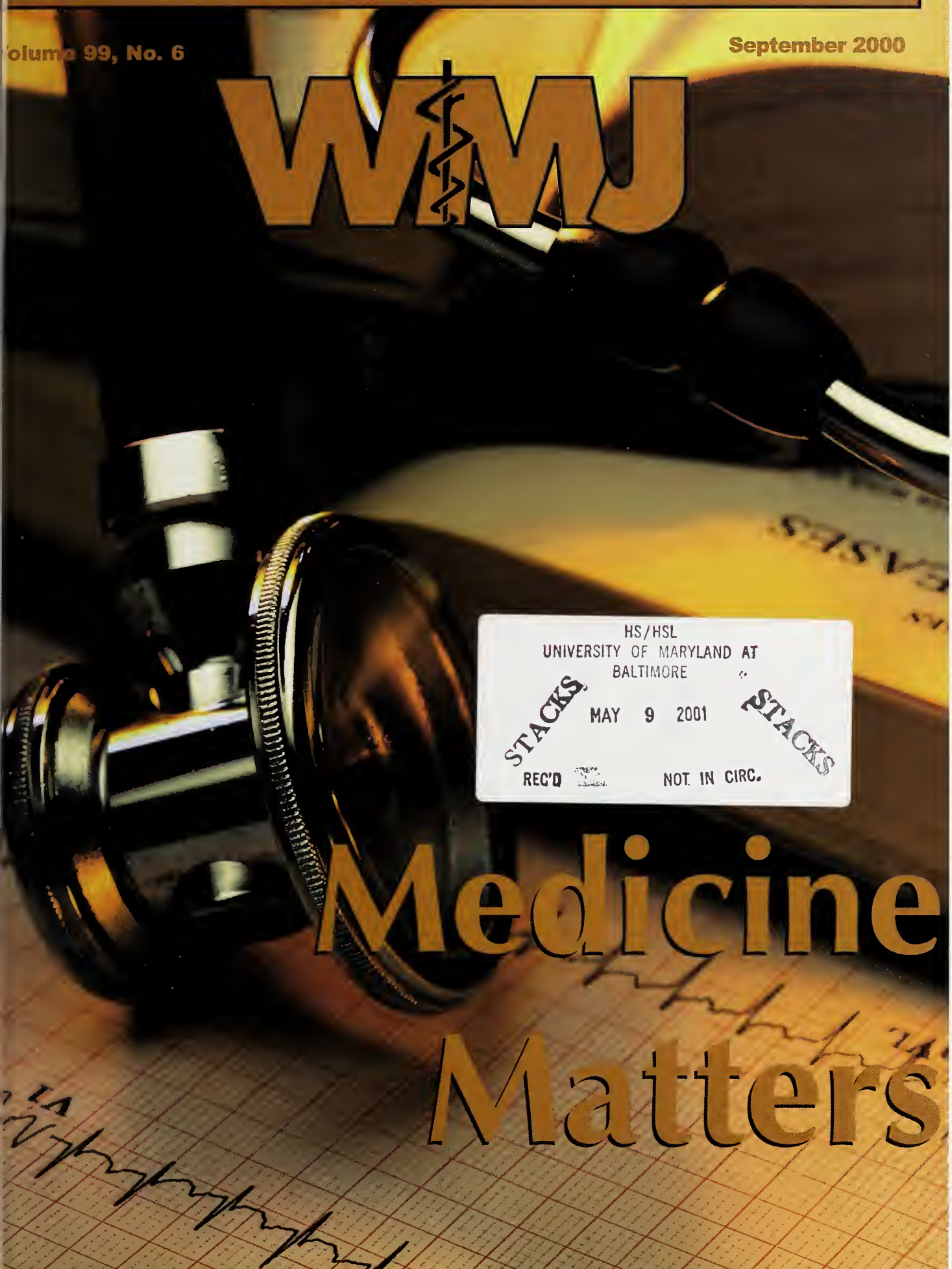

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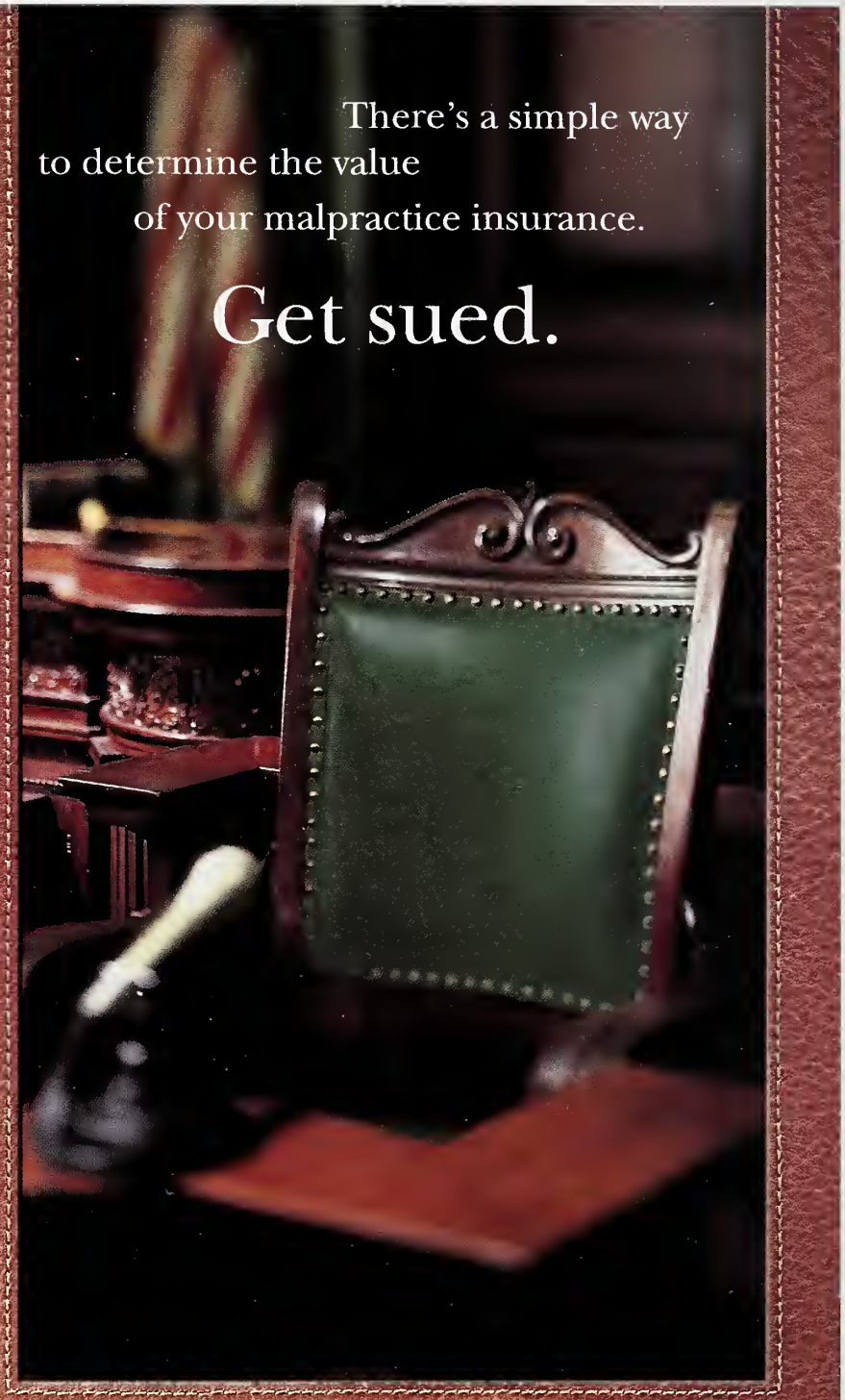

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Thomas C. Meyer, MD

Editorial

Something for everyone

by Thomas C. Meyer, MD, WMJ *Medical Editor*

The plan was to devote this issue of the *WMJ* to a series of papers dealing with end-of life issues. Unfortunately, our proposed authors found themselves overwhelmed by day-to-day responsibilities and could not find the time to put pen to paper. Nevertheless, it is our hope that we can put together a sufficient number of papers dealing with the difficult and time-consuming tasks surrounding dying patients. We would welcome manuscripts dealing with some of these issues. We are taking this opportunity to present some of the interesting case reports that have been backed up for some months and have important messages.

Perhaps the most intriguing communication is Dr. Charles Schauberger's discussion of the Risk Issues Associated with Complementary and Alternative Medicine (p 11), which discusses the responsibilities of physicians to remain current in these disparate areas of alternative therapies. Attorney Swanson enlarges on the Emerging Liabilities of Mainstream Practitioners (p 13). Dieter and Volperian's description of what could have been a lethal arrhythmia in a patient taking an over-the-counter diet medication (p 20) illustrates the need to remain aware of the active principles of easily available drugs. An ironic twist to their case report appears in the brief letter to the editor (p 4) in which Dr. Dieter informed us that the patient in his case report received cardiopulmonary resuscitation from her husband, whose only training in CPR was that he had "seen it on TV!"

The case reports are always of interest and may dispel some of the "can't happen to me, so I won't worry about it" attitude that may creep into a seemingly rather mundane primary care practice. Who considers Reye's Syndrome in young adults? (p 23) Who even remembers that tricuspid valve insufficiency is a described complication of Carcinoid Syndrome (p 29) and when do we consider severe liver disease in the differential diagnosis of dyspnea and severe hypoxemia (p 25)? Equally, when do we consider intra-abdominal deposition of fat in patients who present with with a recent history of suddenly expanding girth (p 29)?

The report and abstracts from the Fall 1999 WReN meeting have several items of interest, including the idea that the radiological over-read of x-rays taken in a number of FP's offices seldom contributed to the outcomes of care; a nurse-educator in the office contributed significantly to improvement of dyslipidemias and hypertension in another set of primary care offices; and a nurse counseling may help in the reduction of unintended pregancies.

Finally, Dr. Jack Westman provides compelling arguments for joint efforts between the health care and criminal justice systems in dealing with the problems of street drugs (p 9). It certainly seems more rational than what is being tried at the moment.

"The best way to predict the future is to invent."

— Alan Kay

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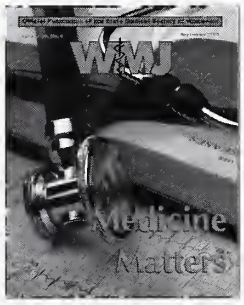

COVER THEME
MEDICINE MATTERS

It seemed time for a little fall housekeeping. In this issue of WMJ, *we take the opportunity to clear out our files and publish a number of worthy scientific and editorial papers that did not fit into our recent string of "topical" issues. These papers cover a range of interesting topics from incorporating alternative medicine into a standard medical practice to an unusual case of adult Reye's Syndrome to a physician carving out a clinical practice in the deep Amazon. There's something for everyone.*

Cover design by Jessica Adsit, *WMJ* Assistant Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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Who's in the News

The Wisconsin Academy of Family Physicians has named **James DeLine, MD**, of La Farge as 1999 Family Physician of the Year. Doctor DeLine has been with the La Farge Medical Clinic since 1983 and has been featured on Wisconsin Public Radio and was a recipient of the State Medical Society Physician Citizen of the Year award in 1996.

William W. Greaves, MD is a representative to the American Board of Medical Specialties from the American Board of Preventive Medicine. He is associate professor and chairman of the department of preventive medicine at the Medical College of Wisconsin and also directs the Medical College's pioneering Master of Public Health degree.

David L. Larson, MD, professor and chief of plastic and reconstructive surgery at the Medical College, was named secretary/treasurer of the American Board of Plastic Surgery. He practices at the Froedtert & Medical College Plastic & Reconstructive Surgery Clinic, specializing in breast reconstructive surgery, cosmetic surgery and head and neck cancer surgery.

Carol Meils, MD was appointed to the Physicians Insurance Company of Wisconsin Board of Directors. She is President of Tricor Cardiovascular Associates, Ltd. in Milwaukee and is a practicing cardiologist and director of the cardiac catheterization laboratory at St. Joseph's Hospital.

Gordon N. Olinger, MD, professor and chairman of cardiothoracic surgery at the Medical College of Wisconsin, was named chairman of the American Board of Medical Specialties Committee on Certification, Sub certification and Recertification. He practices at the Froedtert & Medical College Clinics, specializing in adult cardiac, complex coronary artery bypass, and thoracic aortic surgery and valve repair and replacement.

James E. Youker, MD, professor and chairman of radiology at the Medical College of Wisconsin, is the new president of the American Board of Medical Specialties. Doctor Youker practices at the Froedtert & Medical College Radiology Clinic, where he specializes in chest radiology, cardiac radiology and mammography.

Letter to the Editor

I saw it on TV

In this issue of *WMJ*, we describe a case of sudden cardiac death in a patient who had been taking an over-the-counter diet pill, Metabolife (p 20).

A second point borne out of this case is the impact which television can have upon society. The patient's husband had originally found his wife slumped on the kitchen floor after he heard a "thud." After finding his wife, he called 911 and began cardiopulmonary resuscitation. The husband performed effective CPR for five to 10 minutes until the paramedics arrived to defibrillate the patient.

When asked where he learned CPR, the husband replied, "I saw it on TV." As physicians, we need to understand the potential benefit and use of multimedia in distributing information to our patients.

Robert S. Dieter, MD and Vicken R. Vorperian, MD
University of Wisconsin-Madison Department of Medicine

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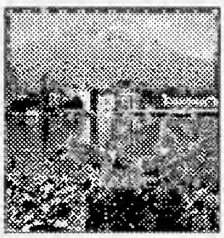

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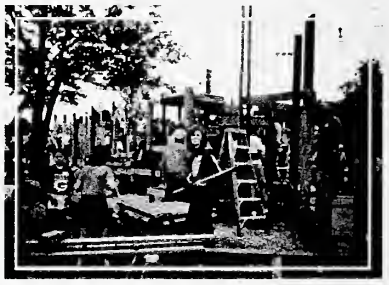

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Medicalize Rather than Legalize Street Drugs

by Jack C. Westman, MD

New Mexico Governor Gary Johnson made headlines when he advocated legalizing the use of cocaine, heroin and marijuana. He declared the "war against drugs" a costly failure. He noted that illegal drugs continue to contribute massively to crime, domestic abuse, child neglect and abuse, and unemployment.

Governor Johnson is right. The war against the suppliers of drugs is not being won, but its focus is changing. The number of illegal drug users has dropped from 25 million in 1979 to 14 million in 1998, but the age of first use also has dropped —10 percent of 12–17 year olds currently report using illegal drugs. Parenteral drug abuse is linked with Hepatitis C and HIV/AIDS, and drug abuse in general is associated with sexually transmitted diseases. The use of "club drugs" such as MDMA ("ecstasy") and LSD is increasing.

Marijuana poses different issues than other street drugs. It is like tobacco because chronic marijuana smoking exposes users to the risks of pulmonary disease, including cancer. It can be regarded as addicting because it has a short-lived withdrawal syndrome. It is a "gateway drug" in that most users of illicit drugs use marijuana first. But most marijuana users do not progress to more dangerous drugs. In fact, most drug addicts use alcohol and nicotine before marijuana. Although the Institute of Medicine recommends the use of purified or synthetic cannabinoid compounds rather than the raw marijuana plant for the relief of medical symptoms, this year Hawaii became the eighth state to approve the medical use of raw marijuana.

At the same time, 35 percent of all prisoners are incarcerated for drug offenses. But because of the high financial and social costs of imprisonment, attitudes are beginning to sway from criminalization to legalization — with the support of politicians such as Governor Johnson. The only sensible solution, however, is to reduce the demand for street drugs, not legalize them.

Vulnerable persons are attracted to illicit drugs for a variety of reasons, most notably the thrill and relief of tension these drugs transiently impart. Some adolescents are attracted by dangerous and illegal activities. Thereafter, outright addiction or habituation can take over.

There are no simple answers to the causes of addictions, which are compounded and even initiated by socioeconomic and family factors. Addiction now can be seen as a "brain disease" or a shaping of the brain toward craving immediate tension relief. However, just how marijuana, cocaine, heroin and other street drugs *affect* the brain has not been fully worked out. Although a personal commitment to stop using drugs is an essential ingredient of successful treatment, the degree of difficulty in making that commitment varies from one individual to another. Many persons who experiment with addicting drugs do not become addicted to them. Because of all of these ambiguities, the health care system is better prepared than the legal system to individualize the management of drug abuse.

The time has come to treat drug abuse as a public health problem requiring the joint efforts of law enforcement *and* the health care system. Simply legalizing cocaine, heroin and marijuana is not the answer. The fact that legalizing these drugs would bypass opportunities for rehabilitating addicts is a great concern. The efficacy of drug addiction treatment has been well established by 30 years of outcome research funded by the National Institute on Drug Abuse. Their publication, *Principles of Drug Addiction Treatment: A Research Based Guide*, can be viewed and downloaded at www.drugabuse.org.

A plan advocated by General Barry McCaffrey, White House drug policy director, is working in over 325 adult and juvenile "drug

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Guest Editorial

Risk Issues Associated with Complementary and Alternative Medicine

by Charles Schauberger, MD

Surveys of the American public indicate that the use of alternative health care providers is much higher than most would expect. Eisenberg and colleagues published results of a 1990 survey indicating that about one-third of Americans were regularly using nontraditional health care providers and more office visits were made to unconventional medical practitioners than to primary-care physicians.[1]

Projected future increases in popularity of alternative systems of care will bring new and different legal issues. It will become increasingly important to consider legal and liability issues as physicians consider their involvement in complementary and alternative medicine (CAM). First, various state and federal laws may affect complementary and alternative care differently. Second, liability may be different, depending on who provides the care, i.e. a physician and a layperson have different legal issues when providing the same CAM service. Third, the degree of involvement of a physician in CAM may affect their personal liability depending on whether they are providing CAM, referring to a CAM provider or refusing to integrate CAM therapies into their practice.

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CAM is different from conventional medicine in many ways. Many of the laws governing conventional health-related disciplines do not have parallel language covering CAM. In fact, CAM may not be regulated by medical or pharmacy boards at all, leaving state consumer protection laws as the sole source of regulation. Each state's consumer protection laws and regulatory code should be reviewed for each of the proposed therapies to determine the legality of a particular practice. CAM might be subject to the restrictions on advertising often found in such statutes. Special care may be required as a result if these services are marketed.

Licensure and credentialing

Licensure and credentialing represent largely unexplored terrain, medicolegally speaking. Most medical and nursing licensing boards have not addressed physicians or nurses providing alternative therapies. Licensed physicians practice according to standards of care as determined by their specialty and the Medical Examining Board. Few specialties have taken a stand regarding how CAM practices integrate into their physicians' realm of knowledge and whether they represent acceptable practice.

Chiropractors are licensed in all 50 states. Acupuncturists are licensed in 38 states. Massage therapists are licensed in 24 states and naturopaths are licensed in 13, whereas homeopaths are licensed in only four states. California licenses over 30 different practitioners. Table 1 lists health-related professions requiring licensure by the State of Wisconsin (Department of Regulation & Licensing).

JCAHO requires that standards for any health care providers be well defined. HR 7 requires documentation of core appointment criteria, including relevant education, training and experience, certification and current competence. Requiring as much credentialing as possible may provide the best protection for an institution. For example, if there is a state or national credentialing program for acupuncture, a person who requests privileges for acupuncture should be required to have the highest credentials. Furthermore, it is advisable for all such practitioners to be required to meet criteria of quality review and regular re-credentialing.

Case law related to CAM provision is limited. In one often-cited case *(re Guess),* a licensed family practitioner in North Carolina offered homeopathic remedies in his regular practice. The state medical board revoked his license to practice, but the state appeals court reinstated him, citing the apparent lack of danger to the public. The state supreme court rejected that viewpoint and granted the medical board's view that his care "failed to conform to standards of

Table 1. State of Wisconsin health-related licensure types

Acupuncturist
Art Therapist
Audiologist
Certified Dietitian
Chiropractor
Dance Therapist
Dental Hygienist
Dentist
Electrologist
Hearing Instrument Specialist
Licensed Practical Nurse (LPN)
Massage Therapists and Body Workers
Medicine and Surgery (MD)
Medicine and Surgery (DO)
Music Therapists
Nurse-Midwife
Occupational Therapist
Occupational Therapy Assistant
Optometrist
Physical Therapist
Physician Assistant
Podiatrist
Psychologist
Registered Nurse (RN)
Respiratory Care Practitioner
Speech-Language Pathologist

acceptable and prevailing medical practice."[2]

Malpractice

Malpractice may arise from several different perspectives. First, some treatments may cause direct harm. For example, chiropractic manipulation of patients with neck injuries may exacerbate the patient's condition. A bleeding diathesis might arise from the overuse of certain herbal supplements. Second, it may cause a patient to not receive effective treatment. For example, a patient is advised to forego usually effective chemotherapy and substitute mineral baths or coffee enemas. Finally, malpractice may result if the patient is not fully informed about the procedure or therapy, possible risks of treatment and alternatives.

There is a significant body of case law related to CAM (perhaps as much as 2000 cases), but much of it is pre-1985 and mostly relate to chiropractic care. Many recent cases relate to constitutional challenges to the states' rights to regulate a practice and other cases involve issues of insurance coverage for CAM. Malpractice is based on tort law and there have been few cases specifically related to malpractice. For many CAM procedures, the standard of care varies and is poorly defined. This may be a two-edged sword in any malpractice case, whether with CAM or conventional medicine. Studdert et al reviewed claims experience for chiropractors, massage therapists and acupuncturists from 1990 to 1996. They found that there were fewer malpractice claims against these practitioners than against physicians. They reasoned that this might be due to:

- the non-invasive nature of CAM; (Medical injury rates increase with invasiveness.)
- CAM is too new and malpractice experience hasn't caught up yet; personal characteristics of CAM providers, or the dynamics of patient-provider relationships are associated with reduced propensity to sue.[3]

Thus far, lawyers have not found it profitable to pursue cases against many providers of CAM because they seldom carry insurance and have fewer assets. This will no longer be the case when physicians and medical centers adopt CAM therapies. Physicians who refer patients to CAM providers may experience "vicarious liability" if there is any element of supervision of the CAM provider, if they seem to be involved in a joint venture, or if the physician or institution fails to provide an adequate evaluation of training and experience. Very quickly, physicians or healthcare systems become the "deep pockets" for any lawsuit involving CAM.

Another concern is liability insurance. Does the standard policy provide coverage if the physician decides to offer CAM therapy? Providers should seek clarification of their coverage with their insurer or seek additional coverage as necessary. In Wisconsin, the Patient's Compensation Fund (PCF) coverage usually follows the coverage offered by the primary carrier; that is, if the insurer provides coverage for the procedure, the PCF should also be thought to provide coverage.

Again, experience in this area is limited. In *Meza v Southern California Physicians Insurers Exchange*,[4] an osteopathic physician injected a wart on the plaintiff's finger with tea tree oil. The tip of the finger eventually had to be amputated. The insurance company refused to cover the damages, citing that the drug was not approved by the FDA. The lower court agreed with the carrier and the appeal court agreed with the findings.

An attempt has been made by some CAM providers and their attorneys to avoid describing CAM as therapy at all to avoid issues of standard of care. Instead, the tort concept of general negligence is sought, arguing more for a standard of "reasonableness" and avoiding the issue of malpractice entirely.[5]

Is there liability for NOT offering CAM? Perhaps in the future, a physician will be held accountable in a malpractice suit because he has dismissed an alternative therapy and is providing "substandard medicine" because his patient was not informed of all treatment options available for the ailment involved, including the unconventional options. Recently a claim was filed in Wisconsin against a medical center for failure to diagnose systemic candidial infection.

Informed Consent

As much as possible, the responsibility for deciding to pursue CAM must rest with the patient. The provider needs to make sure that the patient understands the therapy in detail, along with

alternative modes of treatment and the benefits and risks of each alternative. It is not enough to just provide a description about the proposed mode of therapy, its potential risks and complications. It is also important to provide a discussion of the alternatives. Do all non-physician providers of CAM understand the conventional medical alternatives adequately enough to obtain informed consent? The experimental nature of any proposed treatment should be emphasized with patients and patients should be made to recognize that they are free to withdraw their consent at any time. Waivers of liability have often been disallowed by the courts and should not be seen as a substitute for full and informed consent.[6]

The physician needs to be aware of what alternative therapies his patient is pursuing. Since many people do not volunteer the information to their physician, it is important for the physician to inquire as to alternative therapies, vitamins and supplements during the history part of any patient encounter. To properly counsel his patient, the physician also may have a duty to familiarize himself with the content of alternative therapies and how they may interact with physician-prescribed care. Staying current with CAM research is important for those who provide CAM but also for those that don't. Hospitals and medical centers may find the safest way to get involved in this area may involve setting up a center of research for these modalities and acknowledging the experimental nature of many of these treatments up-front. The use of these techniques, in the beginning, is therefore strictly regulated and the medical center gains a "halo" effect from its involvement with researching these revolutionarily new techniques.[7,8] In summary, prior to providing CAM therapy, a medical provider or health care system should consider:

1. Licensure and credentialing requirements
2. Specialty society position on the subject
3. Scientific basis for the therapy—related to both effectiveness and safety
4. Appropriate training of the providers
5. Potential for harm
6. Whether it is complementary or alternative. If complementary, how will it impact the conventional therapies? If alternative, will it cause the patient to forego other therapies?
7. Liability experience of the CAM therapy
8. Liability coverage
9. Potential for obtaining informed consent
10. Regular review of the literature
11. Re-credentialing

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Editorial Responses

Some Emerging Liabilities in Complementary and Alternative Medicine

As Dr. Schauberger's article indicates, the growing prevalence of alternative medicine and therapies raises new questions about liability risks. While Complementary and Alternative Medicine (CAM) was once dismissed by mainstream practitioners as sheer hucksterism, many types of treatments are now getting closer inspection and consideration for inclusion into mainstream practices. A number of medical schools now offer classes in alternative medicine, and in 1992 Congress created the Office of Alternative Medicine within the National Institutes of Health. One reason for the proliferation of these types of services is simple public demand.

Adding CAM Services

Managed care organizations include specific alternative therapies, including chiropractic, acupuncture, diet and exercise classes, just to name a few. Bringing services like these into the same organization is considered "integrative medicine," and as such offers some protection against liability risks. By incorporating alternative therapies cautiously and conservatively into a practice or organization, there is an opportunity to properly credential and verify the practitioner, to impose restrictions and protocols that are in keeping with organizational goals and to limit the scope of the treatment. There is also more opportunity to maintain an effective relationship with the patient, who can add complementary or alternative treatment without sacrificing the traditional care offered within the organization. Offering alternative therapies,

especially for treatment of chronic conditions such as back pain, affords the opportunity for the patient to participate in decisions about treatment. Patient participation usually enhances the practitioner-patient relationship, and this shared decision-making reduces the potential for claims of negligent care.

Referrals

Referring patients to alternative practitioners outside the organization or practice can be risky for all of the same reasons: there is less ability to determine the skill level of the practitioner, the true scope of practice, and the practitioner-patient relationship may change. A referral from a licensed practitioner (i.e. physician) to an unlicensed practitioner carries its own risks, particularly if a lawsuit eventually occurs. In that circumstance, the deep pocket and hence the target will be the licensed practitioner. An additional risk is that the patient may *replace* conventional therapy with alternative therapy, instead of enhancing conventional therapy.

Reducing Your Risks

For physicians, here are some key things to consider:

- Educate yourself about what complementary and alternative therapy is currently being offered in your community to your patients.
- Ask your patients what else they are doing besides your recommended treatment (especially ask patients about over-the-counter herbals/preparations/ natural supplements they are taking—you will be surprised at the answers).
- Don't expect your patients to offer the information; you will have to ask probing questions.
- Work with the patient who wishes to consider alternative therapies; if a patient goes against your advice, document the discussion, your concerns, and your conveyance of these to the patient, in addition to his/ her decision.
- Refer outside your organization cautiously, and research the referral practitioner as carefully as possible. Refer to licensed practitioners whenever possible.
- Document thoughtfully, with attention to the patient's participation in the decision-making.

In the final analysis, physicians will be held accountable for their own actions, and this is appropriate. By advocating for safe and effective patient care when considering complementary and alternative therapies, physicians are more likely to maintain effective practitioner-patient relationships and less likely encounter increased risks of liability exposure.

Kathy Swanson
PIC Wisconsin

The Medical Examining Board and Alternative Medicine

In any complex social phenomenon the role of government, agencies and Boards is to strike a reasonable balance between *education, regulation* and *enforcement.* If some of my patients are using complementary or alternative medicine (CAM) methods or medications at the time that I see them, I need know as much as I can about how those CAM modalities might effect my standard medical approaches. Therefore sitting on my desk next to the standard *PDR* is the new *PDR of Herbal Medicine* because I need to know whether the saw palmetto the patient self-administers for his prostate wellness is going to affect the PSA levels being screened for prostate cancer. And I need to know that the St. John's Wort my patient may be taking with or without my knowledge lessens the effectiveness of the HIV medicine indinavir and the transplant drug cyclosporin. That's why 68 Medical schools now offer for credit courses, lectures and seminars on alternative therapies. That's why county medical and specialty societies invite knowledgeable speakers on herbal medicine and 'nutraceuticals'. And that is why we also should require CAM practitioners to be equally diligent about this essential, mutual, *education* process

But there is a role for *regulation* as well. I was alarmed to read in the newspaper that on February 7 of this year the FDA "gave manufacturers the right to sell herbal remedies and other 'natural' products to treat morning sickness without first proving that the preparations were safe for unborn children." I was relieved to hear on the February 8 nightly news that the FDA had reversed itself on that position that day, (even more quickly than the Department of Labor had reversed itself on the OSHA home office regulations). With the explosion in herbal medicines in terms of advertising, availability and potency Congress should revisit its 1994 decision allowing the FDA to classify these products as "food supplements", escaping safety and efficacy scrutiny. The MEB will need to promulgate reasonable and well founded regulations, where necessary, with respect to CAM practitioners and procedures to protect the public, which is its statutory responsibility, and yet not unduly or unnecessarily interfere with access to alternative care for those persons who choose such.

Finally *enforcement* may at times be indicated and necessary. Using an ozone enema (insufflation) to rid the body of its toxins preventively perhaps is not the practice of medicine, but to use any such measure to rid the body of demonstrated disease is the

of demonstrated disease is the practice of medicine. Simply and clearly stated, to practice medicine in Wisconsin you must have a medical license! When there is a clear violation of that statute, the appropriate penalty needs to be applied.

The Medical Examining Board has an important duty in Complementary and Alternative Medicine with respect to regulation where appropriate, and enforcement where necessary, in order to carry out its statutory responsibility. At the same time the MEB should be active in educating the public, and itself, about this important matter. For starters I would recommend that all physicians, and CAM practitioners, read the 1997 AMA Report 12 of the Council on Scientific Affairs as an excellent comprehensive and balanced document on Alternative Medicine.

"First, do no harm", in terms of public safety and protection, is a dictum applicable to all practitioners, traditional or nontraditional. The challenge for the Department of Regulation and Licensing, and the MEB, is to codify and apply that dictum in an enlightened and balanced way to all who hold themselves out to be *treators,* no matter how they identify themselves philosophically.

Darold Treffert, MD
St. Agnes Hospital Behavioral Health Dept., Fond du Lac, WI

Legalize Street Drugs

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courts" in the United States (including Dane and Milwaukee Counties). The sentence for illegal drug usage is treatment that may include substituting medications for the illegal drugs through the health care system. The most successful treatment emphasizes individualized assessment embedded in a continuum of services, including job training and placement.

New York recently became the first state to require that nonviolent criminals who are drug addicts be offered treatment instead of jail time in an effort to reduce both the number of repeat offenders clogging the courts and the state's jail and prison populations.

The Physician Leadership on National Drug Policy, headquartered at Brown University, notes that the cost of treating is one-sixth the cost of incarcerating a drug addict. Treatment also results in marked reductions in crime and in health care utilization by addicts and their families. In Wisconsin, the challenge is to obtain parity in health insurance for the coverage of mental illness and substance abuse.

Powerful resistance to the public health approach to our drug problem comes from those who advocate zero tolerance and incarceration, those who advocate unregulated legalization, those who profit from the prison industry, and those who produce and distribute illegal drugs.

Still, we need a new paradigm for dealing with our drug problem. The quasi-military war model is not working. Public health prevention and treatment programs that reduce both the demand for drugs and the public costs of addiction deserve a chance.

At the very least, the public health approach provides medically managed drugs and medications for addicts. This removes organized crime as the source of addicting drugs and criminal acts as the means of obtaining them.

Draft Guidance on Compliance Plans

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of billing compliance and a medically trained person to determine that bills are accurately coded, reflect the services provided and that the services provided were reasonable and necessary (including sufficient medical record documentation). Absent any known problems, a reasonable self audit sample would be two to five medical records per payor or five to 10 medical records per physician. Periodic audits could include a valid sample of the practice's top 10 denials, or the top 10 services provided and involving a self-disclosure protocol if fraud is detected.

Appendix A to the draft addresses additional risk areas for physicians including advanced beneficiary notices (for services not covered by Medicare), billing for noncovered services, the provision of reasonable and necessary services, third party billing services, potential anti-kickback or self-referral violations. The other appendices include other relevant civil, criminal and administrative statutes, OIG/DHS contact information, the self-disclosure protocol and internet resources. The draft guidance can be obtained on the Internet at www.hhs.gov/oig/new.html.

Seeking Remedies in the Rainforest

by Linnea J. Smith, MD

Sitting in my thatched-roof house at the edge of the Amazon rainforest in Peru, using a kerosene lamp for light, I find myself perplexed as to how to relate public health issues in Wisconsin to those in rural Amazonia.

In the United States, our expectations are high, for the obvious reason that for a very long time we have had access to ways to fulfill the simpler expectations. In contrast, here public health issues are somewhat more basic than in developed countries. For instance, how does one convince those who have always taken their water straight from the Amazon River that it would be better to boil that water before drinking it? This is more than a minor point. Children expire here with high enough frequency that when I take a history, I have to ask women how many living children they have, and how many dead ones, and the proximate causes for so many infant deaths are primarily diarrhea and pneumonia. Clean drinking water is one of the basics of public health, yet this is an area whose population has grown steadily over the last few decades but which still has no indoor plumbing and no electricity outside of the city (Iquitos, 50 miles upriver) — with its population of around half a million people has no sewage treatment program. Whatever flows out of the homes of Iquitos flows downriver to this area. My neighbors bathe daily in the river, wash their clothes in the river and haul buckets of river water up the muddy banks to their homes for cooking and drinking purposes.

So the first public health focus that I would advocate here would be sewage treatment, indoor plumbing and clean drinking water.

Another public health issue, were it possible to resolve, would be the provision of adequate food. Unlike parts of Africa, people do not as a rule starve to death in this area. (There are occasional exceptions, such as infants whose mothers cannot produce enough milk for them and who are fed mixtures of flour and water, or the 8 month old I once saw whose mother had gone for tuberculosis treatment, leaving her infant son in the care of his 14-year-old cousin). The diet, however, is less than adequate. Again, in the United States we not only have access to aisles and aisles of food, but also to a tremendous variety. Our selection is not limited to what we can grow in our area

of the country at the times when it is in season, or what has been canned or otherwise preserved. We can get kiwi fruits. We can get broccoli and strawberries all year round. And of course in Wisconsin, we can get dairy products.

In the jungle, none of that is true. Since there are no roads through the rainforest, at least not in this part of the world, and no railroads, there are no markets except at large centers like Iquitos, and no refrigeration to keep foods for lengthy periods. Each and every day, every family out here fishes, snares small animals, and cultivates its patch of plantains and cassava. What is harvested that day is what is eaten. No harvest, no food. There are few green vegetables available, very little red meat, no milk and heaven only knows how many deficiencies of trace elements. In my tropical medicine book, I was only a little surprised to have it fall open to a page which was discussing zinc deficiency, never shown in free-living populations, affirmed the book — "except in the Amazon in association with fish and cassava diets."

The consequences of this marginal diet are seen in the many children who succumb to pneumonia, and who are so weakened by their malnutrition that they die from chronic diarrhea. And neither the diarrhea nor the malnutrition are helped by the intestinal worms that are endemic here, and which would be far less common were there sewage systems and enough money to buy shoes for everyone. Thus, public health measures in this area might include airlifts of food for everyone within the thousands of square miles encompassed by the Amazon Basin, as well as wells drilled for every isolated homestead, latrines and maybe shoes.

This is rather different from our concerns about mammograms, AIDS screening, and reporting Lyme disease. My own approach is to cooperate enthusiastically with the Peruvian government's vaccine program and even more energetically with its Family Planning Program. Where, after all, is the good in saving a child from pneumonia with modern antibiotics if that child is going to watch his own offspring die of starvation in 20 years?

The point, I think, is that we sometimes forget, in our lofty aspirations for ever better lives, ever longer lives, and improvement of our various and sundry statistical measures, that we aren't so bad off, after all. The people who live where I do are poor, but they are not alone. The majority of the world's population still does not have adequate food, nor indoor plumbing nor ovens, let alone refrigerators or microwaves. The majority of the world's population is slender not because of strenuous dieting or deliberate exercise, but because of a barely adequate diet and plain dull hard work, day in and day out for most of their lives. The majority of the world's population does not have pantries and chest freezers, but depends every day on finding food for that day.

I don't know of any real solutions. Airlifts of food sufficient to feed everyone, everywhere, for the rest of their lives, are hardly practical, nor are individual wells for the millions of communities and isolated families scattered worldwide. But I do think that if we, as the world's wealthiest nation, can keep in mind the fact that we are in fact very well off indeed, perhaps we can then free ourselves from our own concerns enough to try to come up with ways of sharing the wealth.

If, on the other hand, we cannot realize the extent of our own good fortune, we will be unable to even begin to think of possible solutions for the world's problems, and will be doomed to go down in history as a nation of incredible wealth who used that wealth for little more than contemplating its own navel and playing with its video games.

Amazon Medical Project

Linnea J. Smith, MD, is a 1984 graduate of the University of Wisconsin-Madison Medical School and is board-certified in internal medicine. In 1990, she gave up her Wisconsin practice and moved to Peru to where she founded the Yanamono Medical Clinic in the remote Amazon basin of northeastern Peru.

Prior to Dr. Smith's arrival, the local people had no access to health care, and initially she operated out of a small thatched room without electricity, running water, staff, funding or lab services. After hearing a radio interview featuring Dr. Smith, volunteers from Duluth, MN, Thunder Bay, Ontario and Iquitos, Peru Rotary Clubs built a six-room clinic with a well, solar panels, a hammock house for families and adjacent rooms for clinic workers and visiting medical staff.

Today the clinic treats about 2,200 patients a year, all arriving by dugout canoe or on foot. Services include family medicine, prenatal care and birthing, dental care, treatment of snakebite, cholera, parasites, infectious diseases, malaria and trauma. The clinic staff consists of five local residents whom she has trained: a medical assistant, a clinic manager and three clinic workers. Interim staffing has included Peruvian physicians and visiting physicians and dentists from the United States and Canada.

For more information, visit www.amazonmedical.org, or write, email or call Amazon Medical Project, Inc.™, Beth Klipping, Executive Director, 7600 Terrace Ave, Suite 203, Middleton, WI 53562; 608.831.3611, ext. 143; Fax 608.831.5485; amp@amazonmedical.org.

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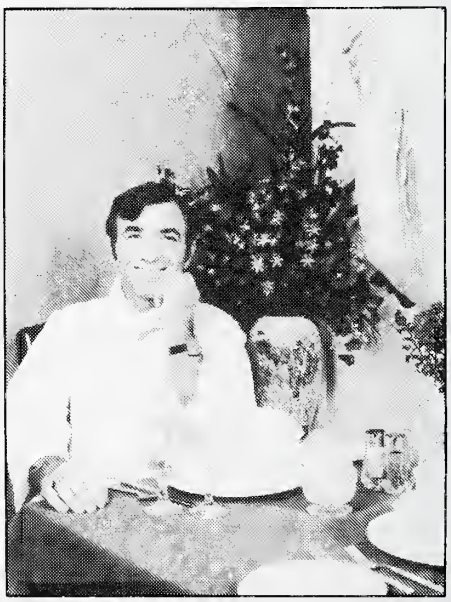

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Sudden Cardiac Death in a Patient Taking an Over-the-Counter Diet Pill

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ABSTRACT

The case of an otherwise healthy woman with a history of palpitations who survived sudden cardiac death from a ventricular arrythmia is presented. Her only medications at the time of the event were alprazolan prn and over-the-counter diet pills. The relation between ventricular arrythmias and over-the-counter diet pills is explored. Basic electrophysiologic principles are discussed as well as an overview for the work-up and long term management of sudden cardiac death.

CASE

A 59-year-old woman was transferred to the University Hospital after experiencing sudden cardiac death (Figure 1). The patient had a ventricular arrhythmia, which required multiple antiarrhythmic agents and defibrillations (14) to restore sinus rhythm. Her medical history was significant for palpitations, which had not been evaluated with any diagnostic tests. The patient was otherwise asymptomatic with no exercise limitations prior to her sudden cardiac death episode. The only prescribed medication which the patient had been taking was alprazolam p.r.n. Several months prior to her cardiac arrest, the patient had started taking an over-the-counter diet pill (Metabolife).

The patient's initial electrocardiogram upon transfer to the University Hospital showed a prolonged Q-T interval with a corrected Q-T interval (QTc) of 550 ms. Her Q-T interval normalized to 316ms (QTc = 409ms) during her hospital stay. Diagnostic cardiac workup included an echocardiogram immediately following her cardiac arrest and prior to her discharge, cardiac catheterization and cardiac electrophysiologic study. Echocardiogram revealed that her post cardiac arrest ejection fraction was 20% (normal $\geq$ 50%) with diffuse hypokinesis. The cardiac dimensions were not enlarged. A repeat echocardiogram 10 days later revealed an ejection fraction of 30%. Cardiac catheterization revealed normal coronary vessels. The patient then underwent a cardiac electrophysiologic study which showed no evidence of conduction abnormality, accessory pathway, nor of other electrophysiologic abnormalities. Furthermore, she was found to have no inducible monomorphic ventricular tachycardia with ventricular programmed stimulation with up to triple extrastimuli at two right ventricular sites.

Because the patient had presented with sudden cardiac death, she underwent a defibrillator implantation. The patient's overall hospital stay was 21 days.

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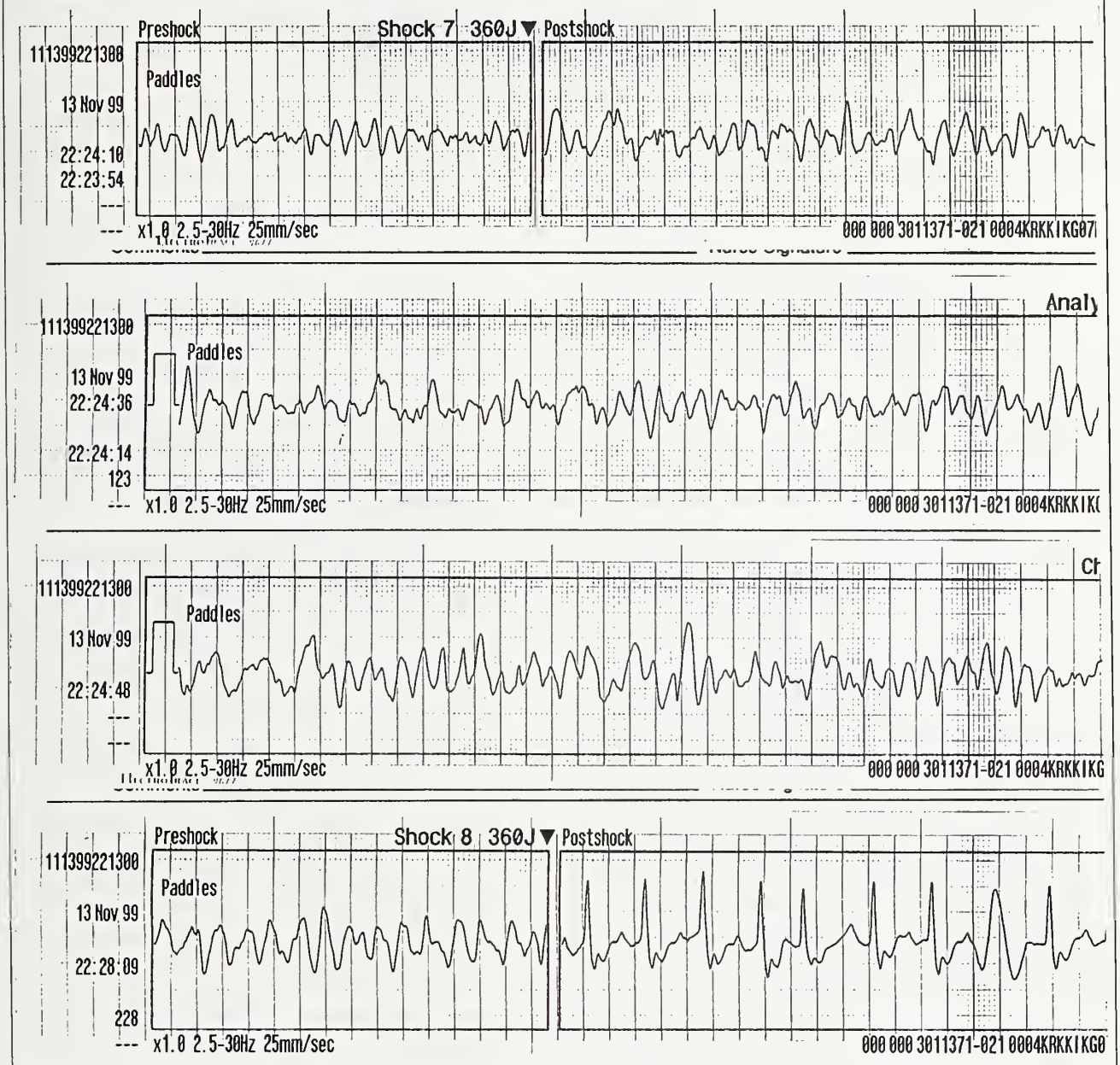
DISCUSSION

This case discusses the occurrence of ventricular fibrillation arrest in the setting of a patient with no known past cardiac history taking an over-the-counter diet preparation whose active ingredient is a sympathomimetic agent.

Over-the-Counter Diet Pills and Appetite Suppressants: A number of these over-the-counter medications contain sympathomimetic agents. Metabolife's active ingredient is "12mg of ephedrine group alkaloids per serving[1]." Ephedrine has been implicated in hypertensive urgencies (impending end-organ effects which require blood pressure reduction within 12–24 hours) and ventricular arrhythmias.[2,3] Ephedrine can have alpha and beta agonist activity on the heart. Challenge with this medication in patients with cardiac ion channel abnormalities may precipitate lethal ventricular arrhythmias.[4]

The Q-T Interval: The Q-T interval is measured from the onset of the Q wave to the end of the T wave on the surface electrocardiogram. It can be measured in the limb leads and/or the precordial leads. The Q-T interval is inversely proportional to the heart rate. Typically, the Q-T interval is corrected for rate because there is normally a shortening of the repolarization at faster heart rates. The formula applied is Bazett's formula.[5] The Q-T interval is corrected by dividing the measured Q-T in ms by the square root of the R-R interval measured in seconds. The normal corrected Q-T interval is typically < 420ms.[6] Patients with cardiac repolarization abnormalities commonly

Figure 1. Rhythm strip of patient's ventricular arrhythmia during cardiac arrest.



have an abnormally prolonged Q-T interval, although it has also been demonstrated that not all patients who are prone to experience Torsade type arrhythmias demonstrate surface electrocardiographic prolongation of the Q-T interval. In this patient, the QTc was 550ms immediate post cardiac arrest, which gradually shortened. Following post cardiac arrest, until metabolic abnormalities and hypoxemia are corrected, the Q-T interval may be prolonged.

Diagnostic Tests: Assessment of the left ventricular function is important in the patient who presents with sudden cardiac death. Depressed ventricular function is associated with a higher incidence of sudden cardiac death.[5] In regards to the case reviewed, the effect of prolonged cardiac arrest on residual left ventricular function should also be taken into account. The patient had prolonged resuscitation (30 minutes). In such situations, the immediate post arrest cardiac function may be diminished.[7] In the case of our patient, there was a 10% increase in ejection fraction from 20% to 30% following recovery from cardiac arrest in a span of 10 days.

The left ventricular function is an appropriate consideration in the medical management of this patient. It has been demonstrated that adverse proarrhythmic

effects are more commonly observed in patients with underlying structural heart disease.[8] Torsades de pointes arrhythmias caused by the administration of antiarrhythmic drugs (an undesired effect of administering antiarrhythmic drugs labeled proarrhythmia) is seen more commonly in patients with underlying structural heart disease.

The results of the cardiac electrophysiologic study in this patient revealed that she had no inducible sustained monomorphic ventricular tachycardia. While the electrophysiologic study may be helpful in risk stratifying patients with underlying coronary artery disease and ventricular arrhythmias, it is less helpful in patients with nonischemic cardiomyopathy. Absence of inducibility of sustained monomorphic ventricular tachycardia in patients with non-ischemic cardiomyopathy does not necessarily predict a good outcome.[9] Therefore, in such patients a defibrillator implantation is indicated.

Finally, this case illustrates the need to take a patient's history of palpitations seriously. It is possible that the combination of the over-the-counter diet pill with its sympathomimetic component (ephedrine) was the primary cause of polymorphic ventricular tachycardia and VF arrest in this patient. As physicians, we must learn about all of the medications our patients are on, even if they are over-the-counter medications.

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WISCONSIN MEDICAL JOURNAL

Reye's Syndrome in an Adult: A Case Report

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ABSTRACT

Reye's syndrome (RS), a condition characterized by encephalopathy and fatty liver, is associated with aspirin use and carries a poor prognosis. The majority of patients with RS are children and adolescents. We report a case of RS in an adult.

CASE REPORT

A previously healthy 18-year-old male naval recruit developed upper respiratory symptoms including fevers to 101°F and frontal headache. For symptom relief, he took 325 mg of aspirin every 4 to 6 hours for a period of 7 days. He then developed persistent nausea and vomiting requiring intravenous hydration as an outpatient. Over the following 48 hours he became increasingly agitated and combative, was hospitalized and restrained, became unresponsive and was intubated for airway protection. He was then transferred to the Medical Intensive Care Unit at Froedtert Hospital in Milwaukee.

Past medical history was unremarkable. There was no history of alcohol, tobacco or illicit drug use. There had been no recent travel. Family history did not reveal hepatic, cardiac, pulmonary or renal disease. As per the family, there had been no other medications used.

Physical exam revealed an intubated, unresponsive male with stable vital signs. Decerebrate posturing was present. There was no scleral icterus but bilateral papilledema was present. Pupils were equal and slowly reactive to light. Corneal, oculocephalic and gag reflex were present. Neck was supple without lymphadenopathy. Cardiopulmonary exam was normal. Abdomen was soft and nondistended. The liver span was 9cm by percussion and there was no palpable spleen tip.

A CT of the head revealed diffuse cerebral edema without intracranial hemorrhage or midline shift. Laboratory studies included blood gases pH 7.51, PCO_2 28 mmHg, PO_2 136 mmHg, on assist control mode at 20/min, FIO_2 40% tidal volume 600 ml. Hemoglobin was 12.6 gms with a normal WBC. Electrolytes and renal functions were normal, glucose was 240 mg/dl, AST 203 u/l, ALT 175 u/l, alkaline phosphatase 68 u/l, total bilirubin 0.5 mg/dl, serum ammonia 179 mmol/L, prothrombin time 13.2 sec (INR 1.26), albumin 3.9 g/dl, serum osmolality 289, ASA 0.7 mg/dl. Hepatitis A IgM negative. Hepatitis B surface antigen negative, hepatitis C antibody negative.

An intracranial pressure (ICP) monitor was placed revealing a pressure of 27 mm Hg (normal <12 mmHg) and aggressive measures were undertaken to decrease cerebral edema. The head of the bed was elevated at 20 to 30 degrees. Intravenous mannitol was given at 1 gm/kg to achieve a serum osmolality of 300–320. Hyperventilation produced a PCO_2 of approximately 25 mmHg. These measures resulted in a reduction of pressure to <15 mm/Hg. A 10% dextrose solution was initiated and lactulose enemas were given every 6 hours. Because of the concern for herpes encephalitis Acyclovir was given pending culture results of cerebrospinal fluid. Sedation and sensory stimuli which could raise ICP were avoided. Repeat CT the following day showed decreased cerebral edema. Serum

Table 1. Clinical staging of level of consciousness in the national Reye's syndrome surveillance system

Stage	Characteristics
0	Alert, wakeful.
1	Difficult to arouse, lethargic, sleepy.
2	Delirious, combative, with purposeful or semi-purposeful motor responses.
3	Unarousable, with predominantly flexor motor responses, decorticate.
4	Unarousable, with predominantly extensor motor responses, decerebrate.
5	Unarousable, with flaccid paralysis, areflexia, and pupils unresponsive.
6	Treated with curare or equivalent drug, and therefore unclassifiable.

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Table 2. Outcome of patients with Reye's syndrome according to their stage of illness at admission

	Outcome				
Stage	Complete Recovery	Mild Neurologic Sequalae	Severe Neurologic Sequalae	Death	Total
	Number (percent)				
0	73 (81.1)	1 (1.1)	0	16 (17.8)	90
1	318 (76.6)	15 (3.6)	4 (1.0)	78 (18.8)	415
2	253 (64.4)	29 (7.4)	8 (2.0)	103 (26.2)	393
3	36 (45.0)	3 (3.8)	2 (2.5)	39 (48.8)	80
4	12 (23.5)	4 (7.8)	4 (7.8)	31 (60.8)	51
5	3 (3.9)	1 (1.3)	4 (5.2)	69 (89.6)	77

ammonia was 83 mmol/L. Over the ensuing 48 hours the patient became increasingly more alert with resolution of the decerebrate posturing. He was easily extubated and mannitol stopped. ICP monitoring was discontinued. Serum ammonia at the time of extubation was 32 mmol/L. He was initiated on a low protein diet which was advanced to a general diet and he was discharged to home on hospital day 7.

DISCUSSION

Reye's syndrome, characterized by rapidly progressive encephalopathy and fatty accumulation of the viscera, was simultaneously described by Reye[1] and Johnson[2] in 1963. The incidence of RS has decreased significantly in the last 25 years. An epidemic involving 379 cases in 1974 resulted in >40% mortality.[3] Between 1975 and 1985 the incidence was approximately 0.3 cases per 100,000 people <18 years of age.[4] As the possible association between aspirin and RS was identified, prescription practices changed and the incidence further diminished. There were only 25 reported cases in 1989 and it has virtually disappeared over the last decade.[5,6]

RS is a pediatric disease. The average age of onset is 6 with the majority being in the 4 to 12 age group.[7] Both sexes are equally affected and for unclear reasons the majority of cases occur in rural areas. While described in the 1970s, adult cases such as our patient are distinctly rare.[8]

The disease typically follows a viral illness, most often an upper respiratory tract infection but occasionally a gastrointestinal infection. Following a period of apparent improvement, as with our patient, there is refractory vomiting followed by delirium with rapid progression to coma. Seizures and death may follow. Focal neurologic signs are typically absent. The liver is mildly to moderately enlarged. Laboratory studies reveal elevated transaminases which occasionally are from nonhepatic origin. Serum ammonia is markedly increased and prothrombin time is frequently elevated. Jaundice is rare.

A number of exogenous agents including aflatoxins, emulsifiers and drugs have been proposed to initiate RS development in susceptible individuals. Typically, aspirin use during the prodrome has been reported in the majority of those developing RS.[9] The differential diagnosis includes meningitis, encephalitis, drug ingestion and metabolic disorders including defects in free fatty acid oxidation, urea cycle and organic aciduria. The principal injury in RS is mitochondrial swelling and dysfunction. Salicylates have been shown to alter mitochondrial activity by uncoupling oxidated phosphorylation. In vitro studies reveal that salycilates are capable of displacing bound fatty acids and dicarboxylic acids leading to alterations in the immune response. It remains unclear whether there is a genetic susceptibility to develop RS in patients with impaired oxidative metabolism of salicylates.

A high index of suspicion is necessary when evaluating a child or young adult with unexplained neurological symptoms in association with viral illness. The clinical staging system is shown in Table 1.[6] Cerebral edema remains the leading cause of death and measures should be taken to decrease ICP. As in our patient, ICP monitoring aids in management. The head of the bed should be elevated at all times at 20 to 30 degrees and external stimuli should be minimized. Intravenous mannitol at 1 gm/kg should be administered to maintain serum osmolality at 310 to 320 in the absence of renal failure. Mechanical ventilation should be initiated with the target PCO_2 being 25 to 30 mmHg. To maintain aerobic metabolism, glucose infusion is necessary.

The duration of CNS dysfunction is the best predictor for recovery. In patients whose illness is mild and brief in duration (≤ Stage 2), recovery is complete. In more severe and prolonged cases there is higher mortality and possible long-term effects including decreased intellectual achievement and altered visual-motor integration (Table 2).[6]

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A Case of Diarrhea and Orthopnea in a 57-Year-Old Female

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ABSTRACT

A 57-year-old female patient with known cardiac disease developed a 4 to 6 week history of diarrhea, followed by onset of orthopnea and subsequent right-sided cardiac failure. On hospital admission she was found to have pure tricuspid regurgitation, without evidence of cardiac ischemia, pulmonary embolism, bacterial endocarditis or pericardial disease. A 24-hour urine collection for 5-HIAA was elevated, and a subsequent octreotide scan documented abnormal uptake in the pelvic cul-de-sac. Bilateral ovarian masses were found at laparotomy, which on pathological examination were found to be a benign left ovarian cystic teratoma, and a right carcinoid tumor of the ovary.

This patient presented with systemic complaints of diarrhea, and orthopnea and right sided heart failure that on evaluation were ultimately found to be due to a unilateral primary carcinoid tumor of the ovary, which accounts for less than 0.1% of all ovarian carcinomas, and only 5% of all carcinoids. Treatment of this malignant carcinoid syndrome presentation consisted of debulking of the tumor and continuation of her diuretics and digoxin. Diarrhea and orthopnea ceased within 2 weeks after her oophorectomy. On evaluation 6 weeks and 6 months postoperatively, her cardiac function was stable, though unchanged. 5-HIAA levels were within normal limits, demonstrating the curative function of surgery in patients with unilateral ovarian carcinoid without evidence of metastases, as well as preserved cardiac function in otherwise stable patients.

CASE PRESENTATION

A 57-year-old female presented to her primary care physician 6 months prior to admission, complaining of nocturnal palpitations. Chronic stable problems included atrial fibrillation, hypertension, mild mural regurgitation, depression, type 2 diabetes mellitus controlled on diet and hyperlipidemia. Medications consisted of the following: Lanoxin 0.25mg bid, Atenolol 75mg/d, Diazide 25mg bid, Coumadin Smg qhs, Prempro 1/d, Lopid 600mg bid, and Paxil 20mg/d. Evaluation at this time consisted of an and ECG, which documented chronic atrial fibrillation and a chest X-ray, which demonstrated mild cardiomegaly. An echocardiogram was obtained, which showed normal left ventricular size with ejection fraction of 77%. Left atrial enlargement was noted at 5.7cm, with mitral valve thickening, mild mural regurgitation and a small pericardial effusion. An exercise treadmill test revealed a small area of mildly decreased counts consistent with attenuation, not ischemia. Twenty-four-hour holter monitoring documented atrial fibrillation.

Figure 1. Admission electrocardiogram

Two months prior to admission she described insidious onset of 4 to 7 loose bowel movements a day, without nocturnal stools, melena, or bright red blood per rectum. Evaluation consisted of microbiological examination of stool samples, which were negative for parasites or bacterial infection, a negative celiac panel, normal serum electrolytes and digoxin level, and a negative flexible sigmoidoscopy. On a routine exam 6 weeks later, the patient complained of orthopnea, without exertional dyspnea, chest pain, pedal edema or wheezing. She had discontinued her diuretic because of the diarrhea, with a weight gain of 6 pounds, but continued to exercise without difficulty. On physical exam the patient was noted to be sitting comfortably, with a pulse

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Figure 2. Admission chest X-ray

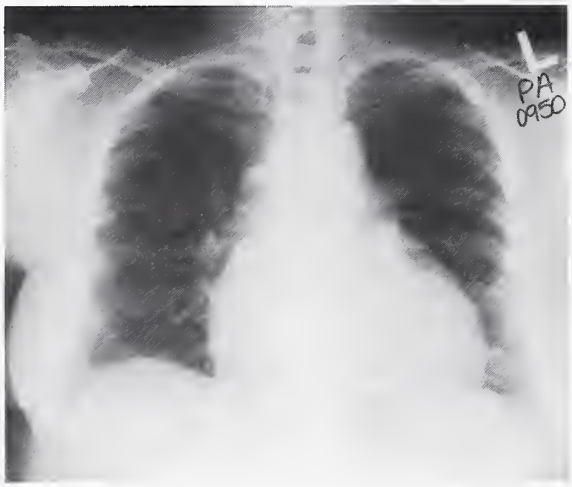
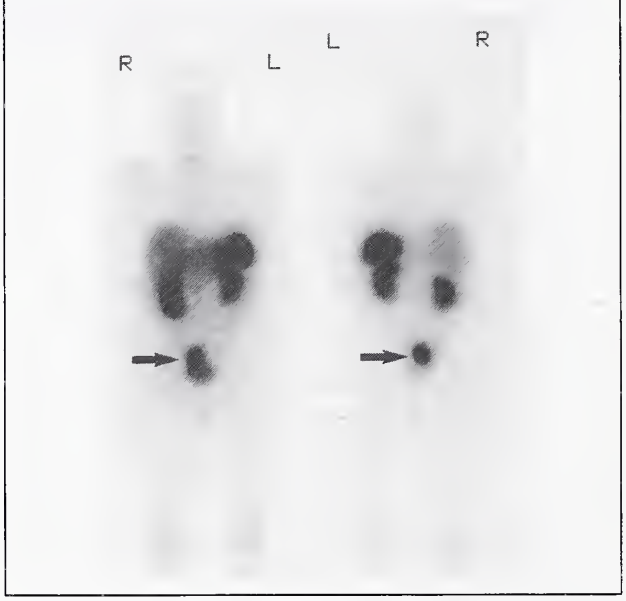


Figure 3. Octreotide Scan at 48 hrs.



= 56, BP = 130/90. No elevated jugular venous pressure was noted, and lungs were clear to auscultation. On cardiac exam an S4 was noted with a soft II/VI blowing systolic murmur. No abdominal distension was noted and the liver was not felt to be enlarged; there was no pedal edema. Pulse oximetry was 98%; a chest x-ray showed cardiomegaly without evidence of failure. Atrial fibrillation with a rate of 80 was documented on ECG at this time, along with non specific ST and T wave changes and normal voltage, unchanged from previously. Furosemide 20mg daily was begun, and a stress echocardiogram ordered.

One week later, the patient returned to clinic with increasing orthopnea, pedal edema and increased abdominal girth. At this time on examination her blood pressure was 130/90 with 10mm pulsus paradoxicus, though difficult to ascertain given her atrial fibrillation. Her pulse was 56, and irregularly irregular. Jugular venous pressure was estimated at 10cm/Hg. Her lungs were entirely clear to auscultation. On cardiac exam she had soft heart sounds without murmur or rub. Percussion of the left lateral chest wall failed to reveal dullness (negative Ewart's sign). On abdominal exam, no ascites was noted. The liver was estimated to be 10cm and was non pulsatile. Spleen tip was non palpable. 1+ pedal edema was noted on examination of extremities. An ECG at this time showed low voltage, with non specific ST and T wave abnormalities (Figure 1). A chest x-ray showed a large globular heart without evidence of congestive failure (Figure 2). She was admitted to the hospital.

Upon admission to the hospital, ventilation-perfusion scan and pulmonary function tests were normal. Transesophageal echocardiogram showed a normal left ventricle without LVH. Ejection fraction was estimated at 65%. Abnormal septal motion was noted, consistent with right ventricular overload. The right ventricular size was increased, with normal function. The right atrium was severely enlarged. Pulmonary arteries were of normal size. The inferior vena cava was mildly enlarged. Systolic flow in the hepatic veins was reversed, consistent with right atrial pressure overload. Severe tricuspid regurgitation was noted, with mild aortic regurgitation and mild mitral regurgitation.

Cardiac catherization was subsequently performed, with abnormal right heart pressures noted (right atrial pressure = 29mm Hg, right ventricular pressure = 30/6 with end diastolic of 16mm Hg). Pulmonary artery pressure was 29/16mm Hg and mean pulmonary capillary wedge pressure was 15mm Hg. A large v wave was noted on right atrial pressure tracing. Left ventricular scintigraphy showed normal regional wall motion with 1+ mitral regurgitation. Mild non-occlusive coronary artery disease was noted in the LAD and RCA. Before discharge, a 24-hour urine collection for 5 Hydroxy indole acetic acid (5-HIAA) was obtained. Results were abnormal: 29mg/24 hours (normal=<9mg/24hrs). The test was repeated on a restricted diet with a similar result of 32 mg/24 hrs.

As an outpatient, a tumor detection octreotide scan was completed (Figure 3). Images were obtained at the time of injection and at 24 and 48 hours. The scan uptake was abnormal in three areas: an area of increased uptake to the right of midline in the neck suggestive of a thyroid nodule, and 2 areas of abnormal intake superior

and posterior to the bladder. Subsequent needle biopsy of the right thyroid nodule was negative. However, pelvic ultrasonography noted a hypoechoic mass in the cul de sac, measuring 7x6x6cm. The mass appeared separate from the uterus by transvaginal probe. At exploratory laparoscopy bilateral ovarian masses were noted and removed.

Frozen section demonstrated carcinoid tumor.

Pathological diagnosis: Right ovary: carcinoid tumor; Left ovary: mature cystic teratoma; no carcinoid

Clinical Diagnosis: Primary carcinoid tumor of the ovary; Carcinoid syndrome with right-sided cardiac failure secondary to tricuspid regurgitation

DISCUSSION

Carcinoid tumors are uncommon tumors, with 3 to 10 cases per 10 million population.[1] Called "carcinoid" because of their usually benign presentation, these tumors can be discovered incidentally at surgery or post mortem, although as in the patient presented, carcinoid may behave in a more aggressive fashion. Only 5% of all carcinoids are ovarian; primary ovarian carcinoid tumors (POCT) account for less than 0.1% of all ovarian carcinomas.[2,3] Eighty-five percent of carcinoid tumors are found in the gastrointestinal tract but may metastasize via the liver to bone, eye, heart and breast. Bronchial carcinoids account for 10% of all carcinoids.[4] While most carcinoids are asymptomatic, bleeding or pain may occur secondary to tumor obstruction. Others behave more malignantly with release of hormones from metastases directly into the circulation. Both diagnosis and treatment have been improved with the advent of somatostatin analogues. Optimal management should be multidisciplinary; the primary care physician will need to coordinate the efforts of radiology, surgery, medical oncology, gastroenterology and other medical specialities as needed.

CARCINOID SYNDROME

Carcinoid tumors are of neuroendocrine origin, and may secrete vasoactive peptides such as serotonin, histamine, bradykinin, substance P, or other neurohumoral peptides that give rise to multiple symptoms. Carcinoid syndrome, which occurs in 5% of patients with carcinoid tumors, most often presents with the classic triad of diarrhea, flushing and right sided valvular cardiac disease.[5] Localized flushing of chest or face is a prominent component of carcinoid, although only 5% of patients with flushing are found to have carcinoid. This flushing can provide clues as to the location of the tumor: gastric carcinoids often present with bright red patchy flushing of the face or chest, while those of foregut origin such as bronchial carcinoids are often violaceous and can be accompanied by telangiectasias, watery eyes and injected conjunctiva. Prolonged flushing can be seen with bronchial carcinomas. Mechanisms for diarrhea may be multiple: 1) increased serotonin secretion by the tumor with subsequent hypermotility, 2) secondary to mesenteric ischemia due to local fibrosis that is serotonin mediated, or 3) nutritional, due to pellagra, since nutritional tryptophan is converted to serotonin by tumor cells, leaving inadequate substrate for incorporation into proteins and niacin.

CARDIAC INVOLVEMENT IN CARCINOID SYNDROME

Our patient presented with diarrhea and right-sided heart failure due to a primary ovarian carcinoid. Although over 300 patients have been reported with POCT, carcinoid syndrome was found in only one-third of these patients.[6,7] Cardiac involvement from ovarian tumors occurs as tumor-mediated humoral agents are deposited via the inferior vena cava or left renal artery directly into the systemic circulation. This is in contrast to the majority of carcinoid syndromes from GI sources, where metastases or humoral substances spread via hepatic mediated circulation. In one series, small tumor metastases were found in only 4% of patients, suggesting that cardiac dysfunction is due to the effects of humoral substances.

The lesions of cardiac carcinoid disease are "distinctive white fibrous plaques localized on valvular and mural endocardium, causing fibrosis and retraction of the affected valves."[8] Diagnosis is usually made by echocardiography. In one series, patients with carcinoid who developed cardiac complications had strikingly higher mean serum, plasma and platelet serotonin levels as well as 24-hour urinary 5-HIAA values four times those of patients without cardiac involvement.[9] The patient presented had levels only slightly above normal, yet had significant right-sided cardiac involvement.

Although cardiac disease can prove fatal, development is unrelated to the duration of symptoms of carcinoid. In carcinoid cardiac disease, tricuspid regurgitation is almost always present, accompanied by tricuspid stenosis, pulmonary regurgitation and/or pulmonary stenosis. Pure tricuspid regurgitation is well tolerated, but combined tricuspid and pulmonic valve involvement can be devastating to cardiac function. Left-sided lesions are present only 10% of the time. In this patient, a negative Ewart's sign (decreased breath sounds in the axilla suggestive of collapse of the lingula secondary to pericardial effusion) ruled against the presence of pericardial disease, subsequently supported by echocardiography.

DIAGNOSTIC STRATEGIES

The diagnosis of carcinoid is often made at autopsy or on routine pathologic examination of specimens from endoscopic procedures or routine surgeries. Elevated (>9mg/24hrs) 24-hour urine collections of 5-HIAA or plasma serotonin levels often provide non invasive means of diagnosing carcinoid. Non-functional tumors may be localized by the use of CT, ultrasound, upper GI with small bowel follow through using enteroclysis for jejunal or ileal lesions. Although radiologic imaging may detect liver metastases or masses, scintigraphy, using somatostatin analogs such as Octreotide or radioactively labeled metaiodobenzyl guanidine (m-IBG), has been better utilized to localize previously undetected primary or metastatic lesions[10,11] with a sensitivity of 89% in one large series.[12] m-IBG is concentrated by neuroendocrine cells and therefore accumulates in carcinoid tumors; octreotide binds to somatostatin receptors, expressed in large numbers by the tumor.

PROGNOSIS AND TREATMENT

Surgical debulking is rarely a curative procedure except in two situations: a solitary small lesion less than 2cm, and as in our patient's case, in ovarian carcinoid where the tumor is localized to one side. In these instances the 5-year survival rate approached 90 to 95%. Survival is much lower in those with larger carcinoids, in GI or pulmonary locations, bilateral ovarian lesions, and in those with initially large levels of 5-HIAA, or maligant carcinoid syndrome. Patients with over 150 mg/24hr 5-HIAA levels had a median survival rate of 1 year. With local disease only, the 5 year survival rate is 95%; with lymph node involvement this decreased to 65%. Those with hepatic involvement had an 18% 5-year survival. The median survival was 2.5 years after the first flushing episode.[10]

Carcinoid symptoms may be controlled with medication such as immodium for diarrhea, antihistamines or H2 blockers for flushing, the avoidance of spicy foods, alcohol or excessive exercise. Somatostatin analogues, such as octreotide or lanreotide have been proven effective in decreasing levels of 5-HIAA[10] With doses of 150 micrograms three times a day, symptoms were improved in 88% of patients. Radiographically demonstrated tumor regression is rare however. Surgical resection of liver metastases may be of use with limited disease. Hepatic embolization has been used in those who are not candidates for surgery, using infusions of gel foam powder into the artery via catheter, or chemotherapeutic agents. Morbidity from embolization can be significant however, and duration of response after embolization is often short; in one study the median response was less than 7 months.[11] The efficacy of liver transplantation is not yet clear.

Alpha interferon has been utilized as a chemotherapeutic agent, as have other chemotherapeutic agents. Immunomodulators in one series were able to decrease tumor size by 20%.[10] In clinical trials, cyclophosphamide, streptozocin and fluorocil have had similar response rates.[10] The use of radiation therapy in treatment has not been well studied, and further trials are needed.

PROGNOSIS OF CARCINOID HEART DISEASE

The location of most carcinoid cardiac lesions on the right side suggests that humoral factors, such as serotonin, are related to the development of lesions. However, treatment that results in lower levels of circulating 5-HIAA does not result in regression of lesions. While some patients have improvement of cardiac lesions after successful debulking of carcinoid tumors, deterioration of the values can progress, even after as long as 5 years.[13] Given improved management strategies for controlling symptoms of metastatic carcinoid, progressive right sided cardiac failure has become a major cause of morbidity and mortality.[14] Mortality from valve replacement can be significant,[15] usually from tricuspid valve thrombosis, perioperative stroke, renal failure or intractable cardiac failure. Careful preoperative risk stratification by age and comorbidity is imperative.

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The Hepatopulmonary Syndrome: A Case Report and Review of the Literature

Khalid Almoosa, MD; and Kenneth Presberg, MD

INTRODUCTION

Acquired gas exchange abnormalities are well described in patients with advanced liver disease.[1–3] However, when dyspnea and severe hypoxemia develop in a patient with liver disease in the absence of known cardiac or lung disease, then the hepatopulmonary syndrome (HPS) must be considered. This under-recognized complication of advanced liver disease is an uncommon clinical entity whose pathogenesis and etiology remain unknown. We present a case of a patient with the hepatopulmonary syndrome and we discuss clinical manifestations, key diagnostic studies and treatment options for patients with HPS.

CASE

A 51-year-old male was referred to the emergency department by a jail nurse who noticed him to be cyanotic and hypoxemic based on documented oxygen desaturation by pulse oximetry (SPO_2 = 83%). Upon questioning, the patient complained of progressive dyspnea on exertion, fatigue and occasional episodes of paroxysmal nocturnal dyspnea, but no orthopnea, platypnea, cough or chest pain. His past medical history was significant for long standing end-stage liver disease secondary to alcoholic cirrhosis. He developed portal hypertension and esophageal varices that bled several times and finally warranted the placement of a portosystemic shunt. He had no known cardiac or pulmonary diseases. The patient was still actively drinking alcohol and smoked cigarettes and cocaine, but denied any known sick contacts or exposure to toxic materials. He was not taking any prescribed medications.

On physical examination, he had a temperature of 96.8°F, pulse of 86 beats/minute and regular blood pressure of 174/96 mmHg, respiratory rate of 20 breaths/minute and pulse oximetry of 88% on room air (92% on 2 liters/minute of oxygen per nasal cannula). He was peripherally cyanotic, but not icteric. His pulmonary exam revealed good chest expansion, no dullness to percussion, and few bibasilar crackles on auscultation with no wheezing. His cardiac exam was unremarkable. Gynecomastia, spider angiomata, and atrophic testes were present, but no hepatosplenomegaly. The extremities revealed clubbing and lower extremity stasis dermatitis with no pitting edema.

Initial laboratory tests were significant for a hemoglobin level of 17.6 gm/dl, platelet count of 107,000/mm^3 and normal WBC count. Serum electrolytes were normal, but liver function tests were moderately abnormal and consistent with hepatocellular injury. An arterial blood gas (ABG) analysis on room air showed a pH of 7.43, $PaCO_2$ of 37 mmHg, PaO_2 of 52 mmHg, and 87% oxygen saturation. The $P(A\text{-}a)O_2$ gradient was calculated to be 49 mmHg. The electrocardiogram showed normal sinus rhythm with mild left ventricular hypertrophy, and the chest radiograph was reported to have borderline cardiomegaly with mild pulmonary vascular congestion (Figure 1).

Pulmonary Function Tests (PFT) showed the following: forced vital capacity (FVC) = 4.32 L (87% of predicted), forced expiratory volume in one second (FEV_1) = 2.94 L (81%), FEV_1/FVC = 68%. Diffusion capacity (DLCO) was reduced at 12 mL/min/mmHg (42% of predicted). These values were interpreted to indicate a very mild obstructive ventilation defect. Because a pulmonary embolism was considered, the patient had a ^{99m}TcMAA lung scan which revealed a normal distribution of pulmonary activity with no perfusion defects. However, substantial activity was seen in the kidneys and brain, suggesting a right to left shunt (Figure 2). An arterial blood gas analysis was then done on 100% oxygen and showed pH = 7.42, $PaCO_2$ = 36 mmHg, PaO_2 = 375 mmHg, and oxygen saturation of 98%. The $P(A\text{-}a)O_2$ gradient was calculated to be 282 mmHg. A contrast microbubble echocardiogram was positive for contrast in the left heart after 5 cycles, consistent with an intrapulmonary shunt. The only other finding on the echocardiogram was a dilated left atrium. Based on these results and the clinical

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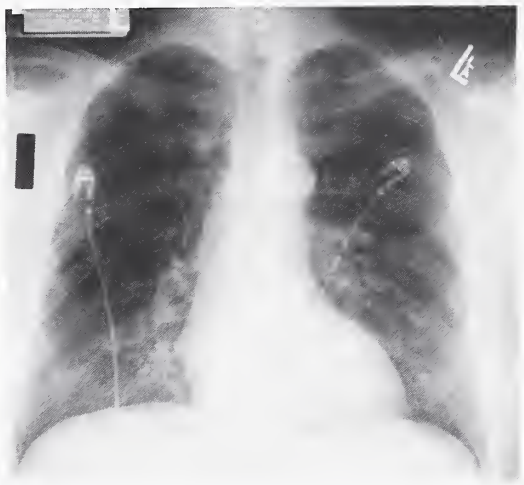
Figure 1. Admission chest radiograph of a patient with the Hepatopulmonary syndrome. This was reported to show "pulmonary vascular congestion" and mild cardiomegaly. However, the prominent bibasilar vascular markings likely represent the intrapulmonary vascular dilatations in this patient with BPS.



presentation, a diagnosis of hepatopulmonary syndrome was made. The patient was treated with oxygen, and bronchodilators were also administered. He was not a candidate for liver transplantation because of his ongoing alcohol abuse. He was discharged on oxygen and bronchodilators.

DISCUSSION

Our patient met the four criteria for HPS[4]: 1) chronic liver disease, 2) pulmonary gas exchange abnormalities with an increased alveolar-arterial gradient, 3) the presence of pulmonary vascular abnormalities, and 4) absence of other significant cardiopulmonary disease. HPS patients may also have orthodeoxia (hypoxemia exacerbated by upright posture and relieved by recumbency) and platypnea (dyspnea accentuated by upright posture). However, these signs are not always present and indeed were absent in our patient. The chest radiograph often shows a bibasilar interstitial pattern.

The association between gas exchange abnormalities and severe liver disease dates back to 1884, when a case of cirrhosis, cyanosis and clubbing was described by Fluckinger,[5] who dubbed it the "hypoxia of cirrhosis." In later years, several cases were reported of similar patients with chronic liver disease who developed decreased arterial oxygen saturation because of pulmonary vascular dilatations. But it was not until 1977 that Kennedy and Knudson[6] first coined the term "hepatopulmonary syndrome" when they described a patient who developed dyspnea on exertion after portocaval shunting for complications of alcoholic cirrhosis.

Arterial oxygenation abnormalities are common in patients with hepatic diseases.[7] The hypoxemia of the hepatopulmonary syndrome, however, is uncommon, and its exact incidence is not known. Patients with HPS most commonly present with progressive exertional dyspnea. Platypnea is well described but not always present, while orthodeoxia is not unique to HPS, but is highly suggestive of it. The hypoxemia may range from mild to profound, and its severity does not always correlate with the severity of the underlying liver disease. Clubbing, acrocyanosis and cutaneous spider nevi may also be present.

The etiology of this syndrome remains unknown. The most commonly accepted hypothesis postulates that there is inadequate synthesis or metabolism of pulmonary vasoactive substances by the impaired liver, leading to a functional vasodilatation of the pulmonary vasculature producing hypoxemia.[8,9] To date, however, no particular substance has been implicated in causing these dilatations, but possibilities include prostaglandins,[10] nitric oxide,[11] vasoactive intestinal peptide,[12] calcitonin,[13] glucagon,[14] substance P,[15] and atrial naturetic factor.[16] Hypoxemia is postulated to be due to decreased oxygen diffusion into the dilated vessels along with decreased intrapulmonary blood transit time. The blood transit time is decreased due to the low vascular resistance in the intrapulmonary dilatations and the associated hyperdynamic circulation characteristic of liver disease.[9,17,18] Therefore, there is not a true shunt and the PaO_2 can be significantly improved by supplemental oxygen. Finally, HPS patients have also been found to have decreased hypoxic pulmonary vascular constriction.[4,7]

Intrapulmonary vascular dilatations have been classified into two types.[19] The more common Type I lesions are characterized by diffuse pulmonary vascular dilatations with a good PO_2 response to 100% oxygen, while Type II lesions are more discrete, localized dilatations that have a poor response to oxygen.

The three imaging techniques that may be used to diagnose intrapulmonary vascular dilatations are perfusion lung scanning, contrast echocardiography, and pulmonary angiography. Technetium 99m-labeled macroaggregated albumin scanning reveals increased radionuclide activity over the brain and kidneys because the large macroaggregates that are normally trapped in the pulmonary capillary circulation pass through the dilated vessels and reach these organs. However, this may also occur with an intracardiac shunt, and therefore this test cannot differentiate between the two. The more preferred specific test for diagnosing an intrapulmonary "shunt" is contrast-enhanced (microbubble) echocardiography. Agitated saline is administered intravenously, and based on the number of cardiac cycles completed before the microbubbles are seen in the left side of the

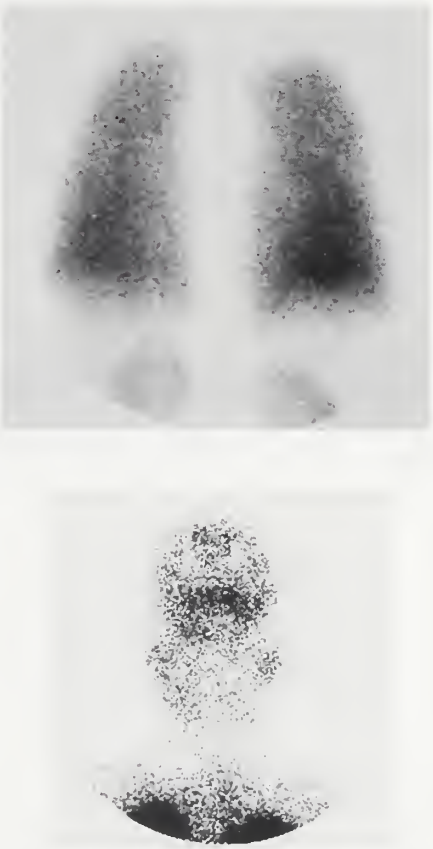
heart, the location of the shunt can be determined. Typically, 4 to 6 cycles indicate an intrapulmonary "shunt," while 1 to 3 cycles suggest an intracardiac shunt. Finally, pulmonary angiography is the most invasive method and can differentiate between Type I and Type II lesions.

Supplemental oxygen improves the hypoxemia and provides symptomatic relief. Other medical therapy for the hepatopulmonary syndrome has been disappointing, and no therapy has been found to be disease modifying. Trials of somatostatin analogues, beta-adrenergic blockers, sympathomimetics, steroids, NSAIDs and plasma exchange have all failed. Spring-coil vascular embolization is an option available to some patients. It involves the percutaneous transcatheter occlusion of pulmonary vascular dilatations by placement of an occluding device (coil spring). The best results are seen in HPS patients with Type II lesions.

The most promising therapy for patients with severe HPS is liver transplantation.[20–22] HPS was once considered a contraindication to transplantation, but now it is considered an indication for liver transplantation. Reversal of the hypoxemia has been reported to occur after transplantation, with the elimination of the need for supplemental oxygen.[18,22] However, correction of the hypoxemia is unpredictable, and may take many weeks to occur. Therefore, these patients may be quite hypoxemic after transplantation, and this can imperil their survival. Interestingly, recent reports have noted improved oxygenation postoperatively with the use of inhaled nitric oxide in these patients.[23,24]

In summary, the hepatopulmonary syndrome is an under-recognized complication of end-stage liver disease. It can be treated with oxygen but it is potentially correctable only with reversal of the underlying liver disease or with liver transplantation. It must be considered in every patient with advanced liver disease manifesting symptoms of dyspnea and hypoxemia. Further research is needed to establish its underlying etiology and pathogenesis so that other specific treatment options can be developed.

Figure 2. ^{99M} TcMAA lung scan showing increased uptake of macroaggregates in the kidneys (2A) and brain (2B), suggestive of a left-to-right "shunt."



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Pseudoascites in the Clinical Setting: Avoiding Unwarranted and Futile Paracenteses

Calvin S. So; and David Schiedermayer, MD

ABSTRACT

Ascites is diagnosed on physical exam by findings of abdominal distension, bulging flanks, shifting dullness and a prominent fluid wave. However, as the following cases demonstrate, these signs may also be positive in pseudoascites due to thick layers of adipose tissue in the abdomen. A history of recent food binging and a lack of a prolonged prothrombin time should raise the index of suspicion for pseudoascites in a patient with a protuberant abdomen. In light of equivocal physical signs, physicians may employ ultrasonography to prevent patients with pseudoascites from suffering multiple futile attempts at paracentesis.

INTRODUCTION

The presence of true ascites in a patient has diagnostic and prognostic significance signaling a wide array of diseases.[1] However, in some patients the clinical presentation may mimic ascites resulting in so-called "pseudoascites." Clinicians can distinguish between ascites and pseudoascites if they have a high index of suspicion for pseudoascites. The following two cases illustrate the diagnostic and management challenges of pseudoascites.

CASE REPORT

Case # 1: A 43-year-old man with increasing abdominal girth for 3 months and a 60-pound weight gain was admitted for evaluation. He also reported occasional shortness of breath that was relieved with deep inspiration and the feeling that his chest was being pushed up from his abdomen He noted mild swelling in his hands and feet and occasional nausea and vomiting without fevers, chills or diarrhea. The patient had used intravenous drugs in the past. He was taking methadone 50mg daily for treatment of narcotic addiction.

On physical examination, the patient was afebrile and other vital signs were stable. He was obese. Sclerae were not icteric. His abdomen was distended and bowel sounds were normoactive. Possible shifting dullness was noted. There was no organomegaly. Both ankles had mild edema. The patient's hematologic studies and electrolyte values were all within normal limits. Notable laboratory values were: serum protein, 7.4 mg/dL; prothrombin time, 12.0 s; alkaline phosphatase, 147 mg/dL; GPT, 105 mg/dL; GOT, 75 mg/dL; and albumin, 3.9 mg/dL.

A preliminary diagnosis of ascites was made. Three paracenteses were performed on the patient; none elicited any abdominal fluid. A subsequent CT did not show any fluid in the peritoneum revealing instead significant subcutaneous fat and some mesenteric fat (Figure 1). During the next two hospital days, the patient disclosed that he had been binge eating at home. He woke several times to eat, ate while in bed, and admitted to eating several pies each day. The patient was discharged, and advised to eat a low calorie diet and to increase his physical activity.

Case #2: A 59-year-old man with a history of alcohol and tobacco abuse sought medical care for abdominal pain and increased abdominal girth. He had gained 45 pounds in the last 4 to 6 months and recently had difficulty buttoning his pants. He had been smoking 3 packs of cigarettes a day for the past 30 years and had been drinking 2 six-packs of beer a week.

On physical examination, the patient was in respiratory distress and had expiratory wheezes. He had a distended abdomen with normoactive bowel sounds, moderate abdominal tenderness with palpation, and no hepatosplenomegaly. He had no fluid wave, caput medusae or rebound tenderness. His extremities had 3+ pitting edema bilaterally and were erythematous. Notable laboratory values were: bicarbonate, 32 mEq/L; white blood cell count, 14,300 white blood cells/mL;

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hemoglobin, 18.3 mg/dL; hematocrit, 55%; prothrombin time, 12.2; and INR, 1.03. Other liver function tests including albumin were within normal limits. Arterial blood gases were: pH, 7.37; pO_2, 61 mmHg; PCO_2, 51; bicarbonate, 36; and saturation, 84% on room air. With three liters of oxygen, albuterol and ipratropium, his wheezing resolved, but his breathing was only minimally improved. A diagnosis of cellulitis was made, he was treated with antibiotics and he remained afebrile and his white blood cell count decreased during his hospital course.

Several paracenteses were attempted, but none retrieved ascitic fluid. Subsequent ultrasonography revealed only fat.

DISCUSSION

Several clues are present in these two cases which suggest that the patients had pseudoascites rather than true ascites. Both of our patients had a normal prothrombin time. Both patients also lacked important physical signs of ascites. The first patient did have possible shifting dullness and mild edema, but lacked a positive fluid wave. The second patient had peripheral edema and abdominal distension, but lacked a positive fluid wave and shifting dullness. Shifting dullness is the most sensitive sign of ascites and a prominent fluid wave is the most specific sign for ascites, whereas abdominal distension does not have a significant positive predictive value.[2,3] The signs that most increase the likelihood of ascites are a positive fluid wave, shifting dullness and peripheral edema; the signs that most decrease the likelihood of ascites are the absence of bulging flanks, flank dullness, shifting dullness and peripheral edema.[4] Positive shifting dullness or a positive fluid wave in conjunction with a prolonged prothrombin time markedly increase the positive predictive value of each sign.[2]

With the recent weight gain (especially with the first patient's significant eating history), both men had increased abdominal girth. Men have a predilection to abdominal deposition of adipose tissue,[5] and weight gain may mimic the increased abdominal girth of ascites. Retroperitoneal and abdominal adipose tissue can mimic ascites.[6] Fiedorek et al also report that, theoretically, any hollow or potentially hollow organ, space or cyst in the peritoneum or abdomen can fill with fluid and simulate ascites.[7] Both of our patients also reported increased shortness of breath which may be due to the recent increased abdominal girth causing a relative restrictive lung disease in both patients.[8] In the case of the second patient, this may have exacerbated his chronic obstructive pulmonary disease.

Both patients also had a history of addictive or binging behaviors. The patient in the first case had a history of drug dependence and possible binge-eating disorder while the patient in the second case had a history of nicotine dependence and alcohol use. One DSM-IV criterion of binge-eating disorder is the loss of control in eating; substance dependence with "substance" defined in DSM-IV as a drug of abuse, a medication, or a toxin, more generally, has the essential features of "a cluster of cognitive, behavioral and physiological symptoms indicating that the individual continues use of the substance despite significant substance-related problems.[9]" Both patients seemed to exhibit some loss of control over substances—food and narcotics in one case, and nicotine and possibly alcohol in the other.

Figure 1. CT of the abdomen in Case Report #1. Patient has significant abdominal deposition of adipose tissue.

Both patients received paracenteses without fluid retrieval. These negative paracenteses helped diagnostically by raising doubts as to whether these patients actually had ascites. Multiple paracenteses, however, besides causing pain and anxiety, can cause serious complications such as increased bleeding, bowel perforation and peritonitis.[10–12]

After multiple unsuccessful paracenteses, each patient was sent for imaging studies. Both the CT and the ultrasonography were useful in detecting the absence of fluid in the abdomen and the presence of much abdominal adipose tissue. Ultrasonography has been touted as the gold standard for evaluating the presence of ascites due to low cost and relative safety.[4]

CONCLUSION

To prevent unnecessary paracenteses and associated risks and pain, the clinician should rule out pseudoascites before preceding to paracentesis in non-urgent

cases. Recent weight gain, increased abdominal girth and a recent history of binge eating, in addition to equivocal physical signs of ascites and a normal prothrombin time, should raise the clinical suspicion for pseudoascites. Given these features, ultrasonography for the evaluation of ascitic fluid is warranted prior to attempting paracentesis.

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Proceedings from the 1999 Wisconsin Primary Care Research Forum and 13th Annual WReN Meeting

Edited by John W. Beasley, MD

INTRODUCTION

The 13th Annual Meeting of the Wisconsin Research Network (WReN), the 1999 Wisconsin Primary Care Research Forum, was held October 29–30, 1999 in Wisconsin Dells, WI. WReN, a statewide network of more than 600 primary care professionals interested in practice-based research, is organized under the auspices of the Wisconsin Academy of Family Physicians (WAFP) Research Committee, and is supported by the WAFP and the Wisconsin Institute of Family Medicine (WIFM). This two-day conference is planned as a working meeting for the participants and includes presentations by invited speakers, original research presentations by primary health care professionals and workshops related to conducting research in the office setting. The following abstracts represent presentations of original research.

Hydrocele Perforation During Vasectomy: How Often and Does it Matter?

J Seidl, Milwaukee, WI

Background: In men, a hydrocele is not uncommon, is often occult, and may be associated with an inguinal hernia. Elective vasectomy is also common, but the rate of hydrocele rupture during vasectomy is unreported in the medical literature. The objective of this study was to estimate the frequency and consequences of hydrocele perforation incidental to vasectomy.

Methods: A database from a series of patients undergoing vasectomy by the no-scalpel technique was retrospectively reviewed for the incidence of complications.

Supplementary chart review was done to determine preoperative conditions and phone contacts were made if needed to assess later morbidity.

Results: Seven perforations were noted in 150 vasectomies. Only 1 patient had a hydrocele documented preoperatively. Three had histories of inguinal hernia and herniorrhaphy. Five patients had evidence of minor swelling early on, but none had additional morbidity or associated complications long term.

Conclusions: This small case series of vasectomies had an incidence rate of perforation of small or occult hydroceles of 4.7%. Providers should be aware of this potentially alarming, but apparently minor, phenomena that may accompany vasectomy.

A Tale of 12 Residencies: Longitudinal Trends in Research During Family Practice Residency

JL Temte, Madison, WI, and PH Hunter, Milwaukee, WI

Background: The future of family practice research is dependent upon the promotion of research culture during training. To assess longitudinal trends in Wisconsin residencies, we examined changes in interest level over a 6-year period.

Methods: Questionnaires were distributed to all family practice residents in training at 12 Wisconsin residency programs during 1992 and 1998 through three separate mailings. Response rates of 70.4% and 70.6% were obtained.

Results: The desirability of research experience significantly decreased ($P<0.001$) from 1992 (87%) to 1998 (77%). Non-significant declines in research interest (48% to 41%) and research activity (7% to 5%) occurred as well. Research interest within individual residency programs increased as much as 38% and declined as much as 32%. Although no specific factors were associated with these changes, research interest in 1998 was highly correlated to the number of residents within a training program, and the number of female residents and the number of faculty. Similar to the 1992 survey, resident research interest was related to female gender ($P<0.025$) and lower PGY status ($P<0.005$). Residents interested in research rated background information and assistance with topic selection as highly important. Active resident researchers rated availability of support personnel, protected time and a forum for presentation as highly important.

Conclusions: Interest in research participation during family practice residency appears to be declining in Wisconsin and has coincided with a 40% increase in the number of residents in training. Specific factors which contribute to this decline have yet to be defined.

Colposcopic Proficiency at a Family Practice Colposcopy Clinic

GL Brotzman, Milwaukee, WI

Introduction: Family physicians frequently provide colposcopic services to their patients. While most family practice residency programs report offering colposcopic training to their residents, very little is written on proficiency in colposcopic assessment and treatment of premalignant genital disease both during residency and out in practice.

Objective: To assess the proficiency of one family practice colposcopic educator in the areas of colposcopic impression

and correlation with cytology and subsequent histology.

Methods: Design—a retrospective analysis of 670 new patient visits to a colposcopy clinic from 1991 to 1998. Setting—a family practice residency program referral colposcopic practice. Subjects—women between the ages of 13–81 who had need for colposcopic assessment. Interventions—colposcopy was performed in a systematic fashion on each patient, with repeat cytology and biopsies obtained as indicated. Abnormalities were assessed by initial visual impression, cytologic impression and histologic impression. All 3 of these parameters were taken into account to arrive at a final assessment.

Results: 670 women were colposcopically assessed, with the median age of patients being 26 years. The main reason for presentation was an ASCUS or LSIL Pap smear (65% patients). Another 11% had a HSIL smear, with the remainder being for various reasons. There was a 71% correlation between Pap smear and biopsy findings ($p<0.00005$). The correlation between colposcopic impression and Pap smear findings was 74% ($p<0.00005$). Finally, there was an 81% correlation between biopsy findings and colposcopic impression ($p<0.00005$).

Conclusions: Family physicians can competently perform with an excellent correlation between cytology, histology and colposcopic impression.

The Clinical Impact of Radiologists' Overreading of X-Rays Taken in Family Physicians' Offices

P Smith, Madison, WI

Background: The clinical value of having radiologists overread x-rays taken in family physicians' offices has been studied very little.

Methods: Seven clinical sites collected 1530 pairs of x-ray readings from both radiologists and family physicians. Chart reviews were done for patients that had significantly discordant readings and the family physician would not have hypothetically asked for radiologic consultation.

Results: 1394 (91.1%) pairs of readings had complete data; 554 (39.9%) would not have asked for overreading. Of those, 107 (19.3%) had significant discordant readings. There were a total of 6 "missed" possible lung nodules. With further investigation, none of the "missed" nodules was clinically significant. There were 2 missed fractures (impacted calcaneal and metatarsal stress fractures) and one missed "possible" Salter II distal first phalanx fracture that resulted in a change in clinical care after the radiologist's reading.

Conclusions: In this hypothetical setting, when the family physician would not have requested overreading, the radiologist's second reading rarely significantly changed patient care or outcome.

Pilot of a Nurse-Based Program to Improve Treatment of Patients at Increased Risk for Cardiovascular Disease (CVD)

D Pine, Minneapolis, MN

Background: It is established that treatment of hypertension, dyslipidemia and tobacco use, is not optimal in primary medical practice. A registered nurse was trained to provide education and counseling for patients with these risk factors in a primary medical practice with 6 clinicians. Algorithms were developed based on national guidelines.

Methods: We evaluated the records of all patients with at least 1 nurse visit. We compared the percentage of patients achieving control of blood pressure and lipids on initial and follow-up visits.

Results: Of the 305 patients attending one or more visits with the nurse, 35 patients were known to have CVD. This number is less than 10% of the number of patients with CVD in the practice. At the time of admission to the program, 19.7% of the patients with hypertension met goals for hypertension treatment and 46% of patients with dyslipidemia met lipid treatment goals. For those patients managed for at least 6 months in the program (86 with hypertension and 23 with dyslipidemia), 40.5% met their blood pressure treatment goals and 78.5% met goals for lipid management.

Conclusions: Results demonstrate significant improvement in the treatment of dyslipidemia and hypertension. Treated patients included a small proportion of patients with CVD. Practice strategies should be changed with a goal of attracting more patients at greater risk for cardiovascular disease.

Factors Associated with Self-Rated Health Status Among Women in a Family Medicine Clinic

LN Meurer, PM Layde, CE Guse, and M Kelly, Milwaukee, WI

Introduction: Self-reported health status ratings depend on whether one references health problems or health behaviors. Previous research indicates that pessimistic health perceptions may indicate underlying emotional distress, predict mortality in elderly patients and correlate with lower socioeconomic status, both via and independently of disease.

Objective: This study explores the association between a single-item health status question and self-reported health problems or behaviors among women in a family medicine clinic.

Methods: All women who present to the Curative Family Medicine Clinic for health maintenance complete a health history form that asks: "In general, would you say your health is: 1) Excellent, 2) Very Good, 3) Good, 4) Fair, or 5) Poor?" The health status ratings from 251 randomly selected records were compared with certain reported demographics, health behaviors (e.g. smoking, exercise), health concerns, depression and anxiety symptoms, vital signs and body mass index.

Results: Using chi-square, health status ratings of fair or poor were found to be associated with race, obesity, exercise and depressive symptoms, but not with age, anxiety, alcohol abuse or smoking. Ordinal logistic regression found different results, with smoking, obesity and anxiety found to be strong independent predictors of self-reported health status. Smokers were 4.17 times as likely to report a less favorable health category than non-smokers.

Conclusions: Self-reported health status is associated with smoking, BMI, depression, anxiety, race and other predictors of future health status. Future research is needed to evaluate the utility of self-reported health status as a screening tool in primary care.

Talking Software for Contraceptive Education and Decision-Making: Development and Evaluation

WL McGill, Prairie du Sac, WI

Background: Of the 3 million unintended pregnancies in the United States each year, half are to those who are using a contraceptive method. Because improved contraceptive choice might mean fewer unintended pregnancies, the current study focused on developing and pilot testing an interactive, multimedia, talking computer program (Contraceptive Options PLUS Software [COPS]) as an education and decision-aide tool for patients.

Design and Methods: The COPS was designed to educate and facilitate decision-making about contraceptive methods. Program design focused on assuring 1) an accurate, unbiased and objective presentation of information; 2) an interactive, informative, personalized and pleasant presentation; and 3) the inclusion of both theoretical and clinical considerations important to contraceptive decision-making and adherence.

Theoretical considerations (e.g., Theory of Reasoned Action) were derived from the scientific literature. Clinical concerns (e.g., contraceptive method convenience) were derived from a series of focus groups conducted with over 20 family planning staff, and from focus group and survey data from 212 family planning patients.

Pilot Test Results: A pilot test of 26 family planning patients suggested that the COPS is technically sound, user-friendly, improves family planning knowledge and may influence contraceptive choice. Significant gains in contraceptive knowledge were found by paired T-test. User ratings of 14 parameters such as program "friendliness" and "trustworthiness" were quite favorable. Preliminary results of a randomized clinical trial to evaluate the COPS support the above findings.

The COPS provides both education and decision-making support for contraceptive users. It is a support tool for any care provider concerned with the provision of contraceptive care.

Studies on the Microecology of Blastomyces Dermatitidis—What's it Doing in My Yard?

DJ Baumgardner, Milwaukee, WI

Background: The microecology of Blastomyces dermatitidis, the dimorphic etiologic agent of the potentially fatal systemic fungal infection blastomycosis, is not well defined. Blastomyces may occur periodically at natural sites, perhaps aided by rotting organic material, animal droppings and physical changes. An understanding of its niche may aid disease prevention.

Methods: Semi-quantitative growth studies of B. dermatitidis on basic salts/2% agar plates determined the ability to utilize or tolerate a variety of substrates including simple and complex molecules as carbon source and organic and inorganic nitrogen sources.

Results: Allantoin, creatinine, quanidoacetic acid, guanidine and cysteine may be used as sole nitrogen source. Allantoin in combination with dextrose, glycerol, lichenen, cellobiose and other wood byproducts support growth of B. dermatitidis at room temperature. The nutritional conversion of the fungus to the yeast form at room temperature, well demonstrated on allantoin/glycerol/yeast extract media, appears to be affected by certain inorganic compounds. The organism tolerates moderate levels of methanol, alpha-pinene, tannic acid, and polyethyleneglycol-200. There are significant strain differences regarding growth of the fungus on various substances at 20E and 37E centrigrade.

Conclusions: A variety of wood byproducts and animal waste substrates, in combination, support the growth of B. dermatitidis. Their role in the ecological niche of B. dermatitidis, and the importance of nutritional dimorphism in the natural environment warrants further investigation.

Can Ideas from Alternative Therapy Help "Heal" Conventional Medicine? Results of a Qualitative Study

B Barrett, Madison, WI

Objective: To investigate the use of alternative and complementary health care in Madison, Wisconsin.

Methods: Semi-structured, in-depth interviews looking at knowledge, attitudes and behaviors. Seventeen patients who used both conventional and alternative therapies within the past year were randomly selected from telephone listings. Twenty alternative practitioners were selected to represent the major modalities. Topics discussed included healing philosophy, choices of therapeutic methods and ideas concerning concurrent use of differing therapeutic modalities. An 8-member multidisciplinary team analyzed the transcripts individually and in group meetings.

Results: Four major themes emerged from the interview data: 1) holism, 2) empowerment, 3) access, and 4) legitimization, allowing us to encapsulate our findings in the acronym "HEAL." Both patients and providers distinguished between the societally legitimized and widely accessible but disempowering and mechanistic attributes of conventional medicine and the holistic and empowering but relatively less accessible and less legitimate nature of alternative healing. There was a strong call for integrating the best aspects of both.

Conclusions: Practitioners and users of alternative therapies in the Madison area: 1) confirmed both the alternative and complementary natures of unconventional health care, 2) called for more integrated and accessible health care, and 3) provided insights that could perhaps be used to help "HEAL" some of the ills of conventional modern medicine.

Nurse Practitioner Counseling to Prevent Unintended Pregnancy: Brief Intervention in Primary Care

KB Lemley, Soldiers Grove, WI

The United States Preventive Services Task Force (USPSTF) recommends "counseling for unintended pregnancy" as a Clinical Preventive Service guideline in the clinician's office. The major aim of the study was to evaluate nurse practitioner (NP) counseling for unintended pregnancy as a brief intervention during a primary care visit scheduled for any reason. The study was based on the Transtheoretical Model (TTM), motivational interviewing techniques and brief intervention.

Hypotheses included: 1) contraceptive counseling will increase patients' intentions to decrease the risk of unplanned pregnancy; 2) patients who demonstrate high levels of self-efficacy, risk perception and social support will demonstrate increased intentions to decrease risk of unplanned pregnancy; 3) contraceptive counseling will result in patients' changing to a new, more effective method or using their current contraceptive method more consistently; and 4) patients exposed to motivational interviewing techniques will demonstrate higher patient satisfaction.

Non-adolescent men and women at risk for unplanned pregnancy, receiving primary care from nurse practitioners in two Midwestern family practice clinics were selected as the target population. A total of 202 men and women participated in this quasi-experimental study. Both control and experimental groups completed pre-visit, post-visit and follow-up telephone surveys.

All psychosocial variables were analyzed as covariates using ANCOVA. When controlling for self-efficacy, main effect for clinic was demonstrated. This finding indicated a trend in the predicted direction. The TTM was demonstrated as a promising method for assessing behavior change in the primary care setting. The study also indicated the need for further research on stage-based counseling.

Needs Assessment for a Curriculum in Public Speaking

R Pachner, J Brill, D Lee

Purpose: Public speaking skills are integral to the practice of medicine. Health care professionals who are skilled in communication are less likely to be targeted for litigation and score higher on patient satisfaction surveys. Medical curricula have placed a great deal of emphasis on doctor-patient communication; however, formal training in communication is rarely offered. Our purpose is to discover the public speaking activities of family physicians and utilize the results as an assessment for the need for public speaking.

Methods: Two numbered surveys were mailed to a random sample of 500 Wisconsin family physicians. It assessed family physician's experience, comfort and training in public speaking. Individual survey items were analyzed for most frequent response and subsequently stratified according to the respondents' practice setting, years in practice and gender.

Results: An average of 6.2 public speaking requests were made to family physicians in 1998. An average of 4.7 public presentations were actually made. Principal requests came from school groups (39%), community groups (37%), hospital meetings (33%). Motivation for presentations revealed: to share information or learning (62%), improve community health (56%). Concerning public speaking training, 90% had no training during medical school, 70% had no training during residency, 90% had <2 hours. Regarding comfort level of speaking, 24% were very to moderately uncomfortable. Concerning the usefulness of public speaking education, 88% thought it would be somewhat to extremely useful in residency, 58% thought it would be somewhat to extremely useful in their current practice. Family physicians that had more residency training in public speaking felt more comfortable, did more presentations and were likely to think it was important.

Conclusions: Public speaking plays an important role in family practice. Common motivations are to improve community health and share knowledge. Most family physicians feel that public speaking is important, yet there is very little training in medical school and residency. Serious consideration should be given to public speaking curricula for future family physicians.

Pilot Study to Identify *Chlamydia Pneumoniae* in Lung Tissue of Patients with Obstructive Airways Diseases

J Ward, DL Hahn

Background: *Chlamydia pneumoniae (Cpn)* is an important cause for acute lower respiratory tract illness and has the capability to produce persistent infection and immunopathologic damage in target organs. Seroepidemiologic studies suggest that persistent infection by *Cpn* is involved in the pathogenesis of asthma, chronic bronchitis and COPD. We have identified one case of autopsy-proven *Cpn* infection in lung alveolar epithelial cell/Langhan's giant cell tissue from a patient with chronic asthmatic bronchitis. However, systematic testing for *Cpn* in obstructive airways disease lung tissue has not been reported.

Objective: To determine the prevalence of asthma, chronic bronchitis (CB), idiopathic interstitial fibrosis (IIF) and COPD in patients for whom lung tissue was available for testing by polymerase chain reaction (PCR) and immunocytochemical (ICC) staining.

Methods: We reviewed medical records of community hospital patients for whom formalin-fixed, paraffin-embedded lung tissue was available from autopsies, surgical resections and wedge biopsies. Patients with clinical diagnoses of asthma, CB, IIF and/or COPD (IIF) who were taking bronchodilator and/or anti-inflammatory medications were identified for later *Cpn* testing.

Results: 221 medical records were reviewed: 117 autopsies, 70 resections, 34 biopsies. Diagnoses of asthma, CB, IIF and COPD were present in 6 (3%), 8 (4%), 19 (9%) and 55 (25%), respectively. Of these, 27 (12%) were also taking bronchodilator and/or anti-inflammatory medications suggesting the presence of reactive airways disease symptoms.

Conclusions: In this study, well documented asthma was rare and never the cause of death. Diagnoses of CB, IIF and COPD were more prevalent but usually poorly documented.

No-Scalpel Vasectomy: Complication Rates in a Teaching Practice

J Seidl, Milwaukee, WI

Objective: Estimate the rates of complications and morbidity for no-scalpel vasectomy (NSV). Compare outcomes with the published literature when possible.

Methods: Patients/setting—80% were referred and 20% were from the family practice residency clinic where all procedures were done. Providers—One family physician

faculty directly attended all cases and supervised resident-trainees. Data—A computerized database file was maintained of patient identifiers and outcomes including a descriptive narrative of any complications.

Results:
N = 153 cases
Total complications = 24%

One major complication (failure to close left vas);	0.7%
Remainder minor complications (no hospitalizations or consultations)	
Infections	2 (1.3%)
Infectious epididymitis	1 (0.7%)
Congestive epididymitis	3 (2.0%)
Minor hematoma (none >4-5 cm)	13 (8.5%)
Rupture of hydrocele	7 (4.6%)
Minor bleeding	6 (3.9%)
Other (ecchymoses, local tenderness, etc.)	21 (13.7%

Discussion: The literature on vasectomy lacks consistent definitions and reports widely varying complication rates. Studies estimate 0.4% to 22% rates of total complications and 0% to 1.6% failures. Hematoma rates for standard vasectomy vary from 0.07% to 22% in cases seen after 1 week. A low rate was reported for NSV (0.09%) but without routine follow-up visits. Infection rates vary most (1.4% to 32.9%) as do clinical definitions. Hydrocele rupture has not been previously reported.

Conclusions: In this series the absence of major hematomas, the minor infection rate of 1.4% and the failure rate of 0.7% seem to compare reasonably with published reports. The overall 24% rate of complications reported seems high but may be inflated by routine follow-up at 1 week, and by reporting minor hematomas, local tenderness, and rupture of hydrocele as operative complications.

Women's Perspectives on Well-Woman Exams: A Qualitative Telephone Survey

M Sarnecki, S Schrager, B Potter

Background: Women commonly see primary care providers for annual health exams. Providers feel pressured to cover specific prevention topics during the exam and thus may be unable to adequately address any concerns beyond these health maintenance topics. By speaking to women directly we hoped to find out if they felt that their needs were not being met in the annual health exam.

Methods: We conducted 26 10–15-minute phone interviews with women from the Northeast Family Practice Clinic in Madison, Wisconsin who had been seen for an annual exam in the last month. The interviews were taped and then entered into the computer as audio clips. They were then analyzed by themes.

Results: The most common themes were continuity of physician (12/26, 45%), communication (12/26, 45%) and physician having holistic interest in the patient (7/26, 27%). Twenty-four of 26 women responded yes to: Do you feel comfortable talking to your provider? Twenty-three of 26 said yes to the question: Do you feel like your provider listens to your concerns? All women responded yes to: Do you feel comfortable with the physical aspects of the exam?

Discussion: Women were surprisingly comfortable with the physical exam, a majority felt they could talk to their providers and that their providers listened to them. The issue of continuity of provider came out as an important theme that we had not considered in preparing our survey. By asking open-ended questions we were still able to allow this and other concerns to come to our attention.

Acute Respiratory Illness in Children: Factors That Influence Number of Visits

A Dimond, J Temte

Background: In 1993, visits to the doctor for respiratory illnesses represented 26% of the total visits made by children under age 15. But number of visits of individual children vary widely with 25% never seeing a doctor and 7% making 37% of the visits. In this study we investigated the factors that influence the number of visits a child makes for acute respiratory illnesses (ARI), looking particularly at the influence of maternal visitation rates.

Method: In a review of charts of mother/child pairs who had been seen at the Wingra, Verona or Belleville UW Family Practice clinics from 1985–1994, we collected basic demographic information and the number of ARI and non-ARI visits made between the child's first and fifth birthdays.

Results and Conclusions: The most powerful predictors of number of ARI visits of the child were the number of non-ARI visits of the child (p=0.000), the number of respiratory visits of the mother (p=0.000), and the number of siblings (p=0.01). Combined, these factors accounted for 28.3% of the variability in a child's respiratory visits (p=0.000). Additional factors that were significantly correlated with increased ARI visits were the clinic at which the child was seen (p=0.000), the mother's employment status (p=0.003), the child's insurance status (p=0.004), and day care attendance (0=0.32).

Barriers and Enhancers in Regular Diabetic Care

M Chadha, E Armstrong, Eau Claire, WI

Background: The Augusta Family Medicine Clinic has tried to enroll their type 2 diabetic patients in a program of more regular and systematic diabetes care and education which is in accordance with American Diabetes Association guidelines. Of the 75 type 2 diabetics, only 15–20 patients enrolled in the program. Therefore, the objective of this study is to learn why only a small subset of patients are more invested in their diabetic care while the majority are not.

Methods: Adult type 2 diabetics attending the Augusta Family Medicine Clinic will be asked to participate in a short telephone interview to be conducted by a research assistant. The questionnaire will consist of open and structured questions.

Conclusions: With this study, we hope to facilitate improved access and adherence with diabetic care provided to Type II diabetics attending the Augusta Clinic. We then hope to extend our findings to similar clinics in rural America.

Telephone and Mail-Based Intervention for At-Risk and Problem Drinking

RL Brown, LA Saunders, LE Axelrod, JM Eberhardt, S Saluja

Background: Previous studies indicate that screening, brief intervention and formal treatment are effective for risky and problem drinkers. Yet, few physicians routinely perform alcohol screening, intervention and referral.The primary aims of this pilot study are to assess the receptivity of risky and problem drinkers to a telephone-administered motivational interview about their drinking. The intervention is based on Prochaska and DiClemente's readiness to change model and Miller and Rollnick's model of motivational interviewing.

Methods: Primary care patients who were of age 25–59, spoke English and were not pregnant were invited in waiting rooms to complete a brief health habits screening questionnaire. Subjects who had an AUDIT score of greater than 7 were eligible to complete a validated diagnostic instrument, quantity/frequency questions, and the Readiness to Change questionnaire. The intervention consists of four 30-minute telephone counseling sessions and post-session summary letters. Each subject provides summative and formative, written and verbal feedback after each interview.

Results/Conclusions: Eighteen patients have completed all four TAMI sessions. Most subjects are pleased to discuss their drinking over the phone. Subjects with alcohol abuse or dependence are more receptive than subjects with risky, non-problematic drinking. Some subjects have reduced their drinking. Enrollment will continue until 40 subjects have completed the intervention.

This study is supported by the American Academy of Family Physicians/Foundation.

Cytotec and Labor Induction Rates

M George, Milwaukee, WI, R Erickson, Tomah, WI

Background: Technology influenced clinical practice but social factors often play a significant role as well. Labor induction is one area heavily influenced by social factors. Cytotec, a less expensive alternative to prostaglandin for labor induction, was first used at the Tomah Memorial Hospital on December 25, 1997. The purpose of this study was to determine if there is a change in labor induction rates following the introduction of Cytotec in a rural midwestern hospital.

Methods: This is a retrospective study of all of the births at a rural midwestern hospital from January 1, 1996 through June 30, 1999. All women allowed a trial of labor were included (n=614). Labor induction rates were then compared using X^2.

Results: There were 652 births during the study period, 38 were excluded due to no trial of labor. During the study period there were 332 births before the introduction of Cytotec—71 induced labors, 261 spontaneous. After Cytotec was introduced, there were 282 births—92 induced and 190 spontaneous. The increase in induction rate was true for both nulliparous and multigravis women. The cesarean section rate was similar before and after the introduction of Cytotec.

Conclusions: There was a significant increase in labor induction rates after the introduction of Cytotec ($P<0.01$). The cesarean section rate did not change. There did not appear to be significant medical factors to explain the change in labor induction rates. Social factors, combined with new technology, probably account for the findings in this study.

Assessment of Dane County Clinician Pap Smear Collection Techniques and the Effect on Inflammatory Pap Results

L Marchand, W Dingel, Madison, WI

Background: For over four decades, the Papanicolaou smear has been an effective screening tool for detecting cervical abnormalities leading to cervical cancer. Proper collection technique is crucial in obtaining quality smears. Obscuring inflammation, blood, thick smears and lack of endocervical cells significantly decrease the effectiveness of the pap smear. Inflammatory Pap smears, in particular, are controversial in their management. Phase 1 of this study assesses the Pap smear collection and management practices of Dane County clinicians.

Methods: The survey sent to 564 gynecologists, family medicine physicians and advance practice nurses in Dane County. Descriptive statistics were used.

Results: Response rate was over 60%. Most providers always or occasionally swab the cervix prior to Pap smear. Most swab the ectocervix first with a wooden spatula, then collect endocervical cells with the cytobrush. Forty-two percent will repeat an inflammatory Pap. Forty-two percent will use liquid based paps to follow up inflammatory or obscured Paps. Over 85% of providers do Paps on patients without cervixes after hysterectomy; however, most of these are on patients who had cancer. Twenty-five percent of providers have no age limit in discontinuing Pap smears.

Conclusions: Most practitioners follow evidence-based guidelines in their practices of collecting Pap smears. Notable exceptions include not discontinuing Paps at age 69 and doing Pap smears after benign reasons for hysterectomy. Inflammatory Paps are often repeated and are a major reason for using the more expensive liquid-based Pap technology.

Reye's Syndrome in an Adult

Continued from page 24

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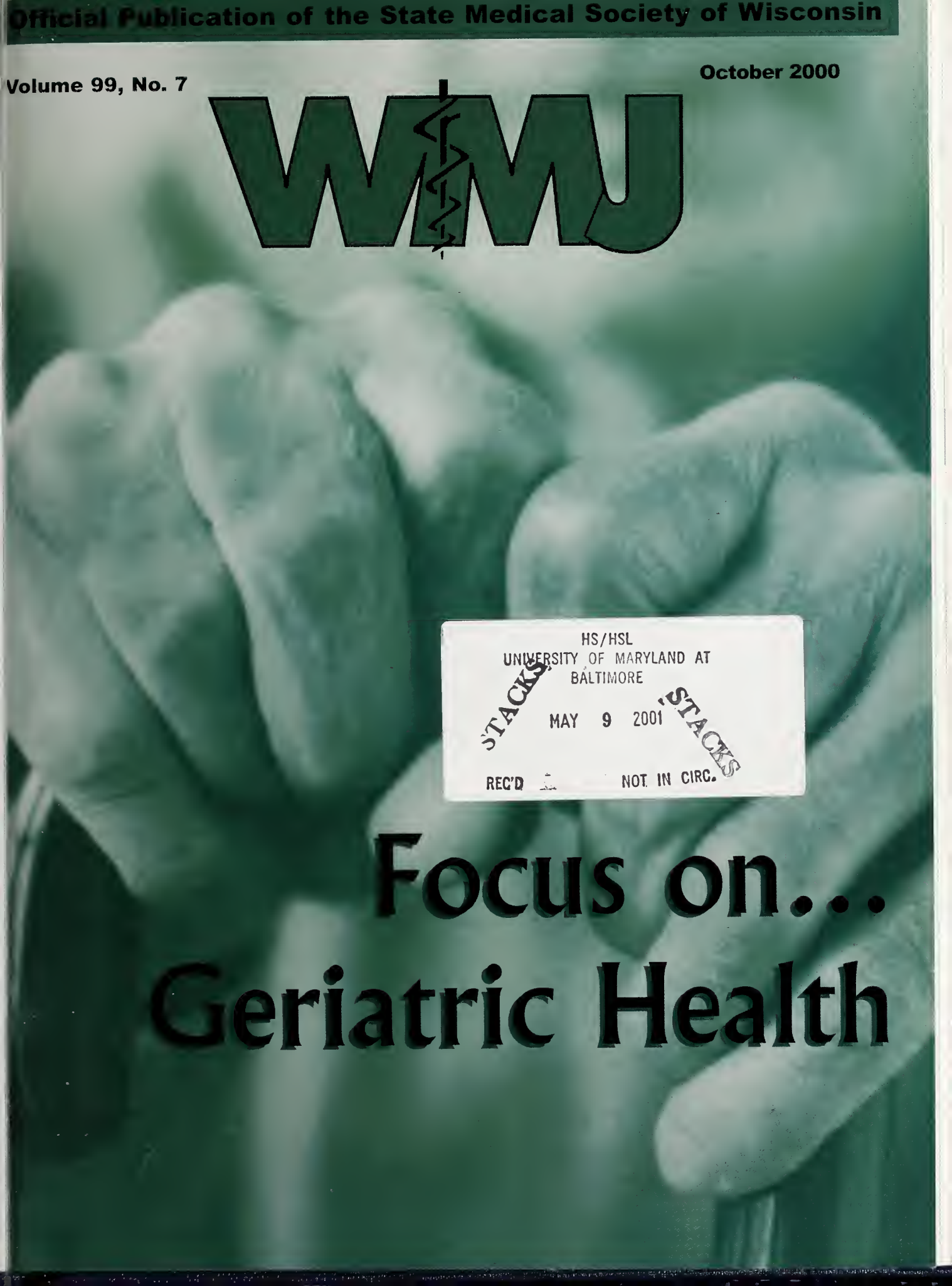
Volume 99, No. 7

October 2000

WMJ



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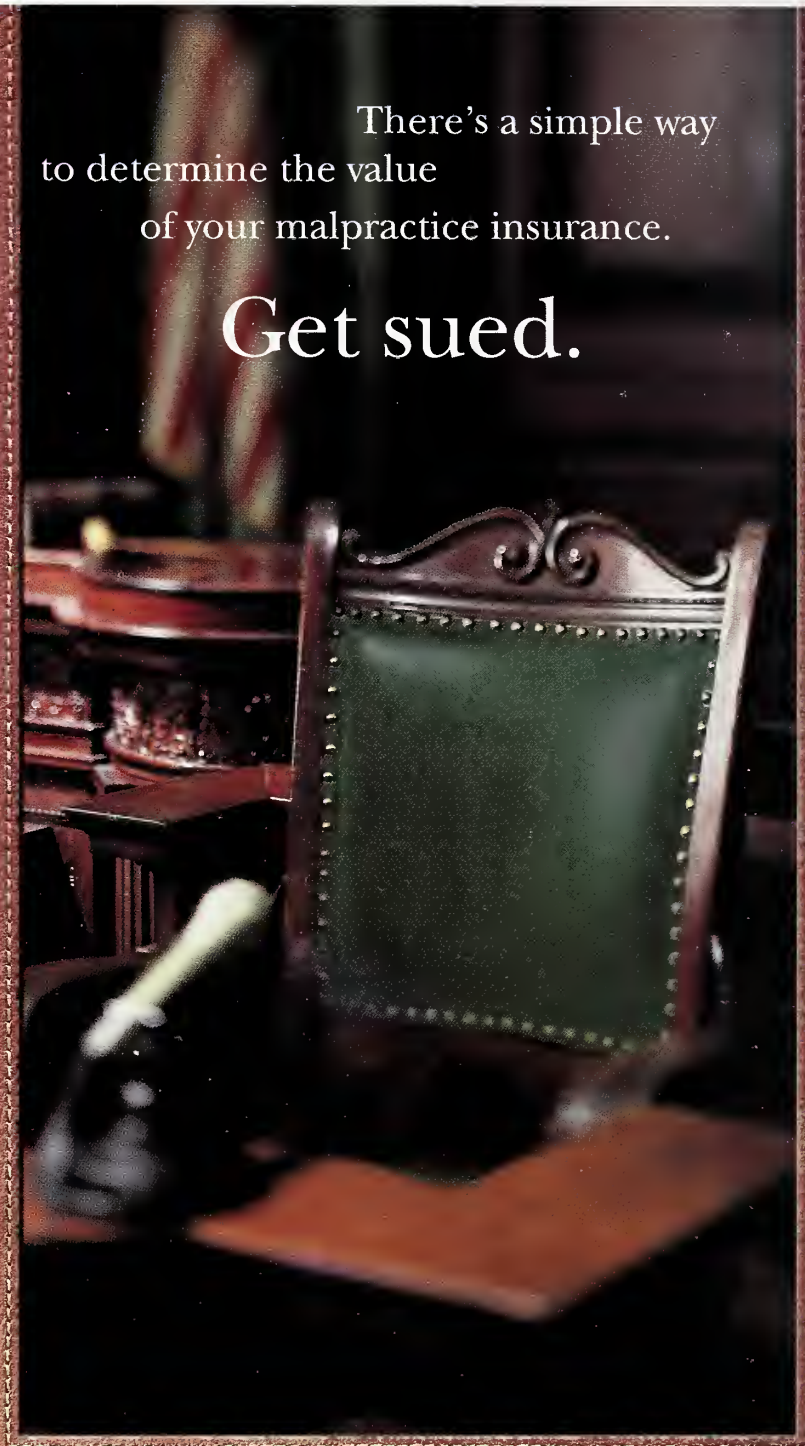

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Thomas C. Meyer, MD

Editorial

Geriatrics and More

by Thomas C. Meyer, MD, WMJ *Medical Editor*

It is always our hope that each *WMJ* issue produces some gems of information for the reader. We hope you encounter some thought-provoking contributions and find reassurance in the re-runs of "old stuff" that warrants a closer look to be sure there is nothing new or unusual slipped in among the well-known.

There is a little of each to be found in this issue, though not as much about geriatrics as had been expected. Once again, we've taken the opportunity to catch up on the backlog of accepted manuscripts to provide some unrelated exotica and food for thought.

Stiles and Perez (p. 8) detail warning signs one might notice within seconds of meeting an elderly patient to determine possible elder abuse, particularly when used with a few screening questions. Their brief reminders of documentation necessities, reporting requirements and resources are also timely.

Hare, Skinner and Riley expand on their earlier study (*WMJ* 1999) on physician assisted suicide (p. 20) while trying to sort out the variables separating those for and against legalization. One may pick holes in some of their methods and the relatively limited sample they had access to, but their contribution will surely be helpful when this issue next comes up for legislative debate.

Chu and Hanson's review of the hypocholesterolemic properties of dietary fiber (p. 32) is timely in view of the recent press coverage of European studies disputing the importance of dietary fiber in the management of abnormal lipid levels.

Of the "non-geriatric related" papers, Dieter and Duque (p. 28) provide the material for medical rounds one-upsmanship - who would not be impressed with the bedside diagnosis of Enteropathy Associated T-Cell Lymphoma for the next case of anasarca and ascites that is admitted? One of my own teachers diagnosed carcinoma of the head of the pancreas on every jaundiced patient admitted to his service. When questioned about this practice, he replied, "One day, I'll be right and everybody will marvel at my clinical acumen, forgetting all the times I was wrong!"

Perhaps the most provocative article in this issue is Whitcomb et al's study of the effect of a single dose of cortisone in ER physicians taking their turn on night shift (p 37). Small as their sample is, it allowed a well-designed preliminary study to be completed with admitted and anticipated shortcomings. One suspects that the investigators got answer enough and will not pursue the issue further. Equally, one hopes that other less careful observers will not misuse the findings in trying to help people struggling with day/night shift changes.

Propeck and Scanlan reassure us that things seem to be moving in the right direction in the provision of breast imaging resources in the state (p. 42) as judged by the follow up to their similar 1998 *WMJ* study.

A gem I found in this issue lies in Marc Kennedy's discussion with David Watts MD—that the vitamin E in the gelatin capsules that so many of us swallow daily is alpha-tocopherol whereas the naturally occurring (and so presumably "really good kind") is gamma-tocopherol!

WMJ

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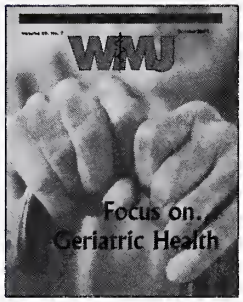

COVER THEME GERIATRIC HEALTH

In just one year, the incidence of elder abuse in Wisconsin rose 6 percent. And as Baby Boomers age, the problem is one physicians will likely address for years to come. In this WMJ *we examine elder abuse and other issues facing physicians and their geriatric patients.*

Cover design by Jessica Adsit, *WMJ* Assistant Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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The *WMJ* (ISSN 1098-1861) is the official publication of the State Medical Society of Wisconsin and is devoted to the interests of the medical profession and health care in Wisconsin. The managing editor is responsible for overseeing the production, business operation and contents of *WMJ*. The editorial board, chaired by the medical editor, solicits and peer reviews all scientific articles; it does not screen public health, socioeconomic or organizational articles. Although letters to the editor are reviewed by the medical editor, all signed expressions of opinion belong to the author(s) for which neither the *WMJ* nor the SMS take responsibility. The *WMJ* is indexed in Index Medicus, Hospital Literature Index and Cambridge Scientific Abstracts.

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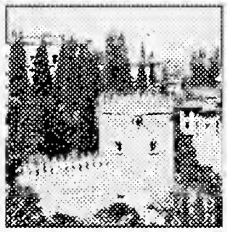

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Who's in the News

Karl Bertram, MD, of Menomonee Falls, received a three-year appointment as Cancer Liaison Physician for the Hospital Cancer Program at Community Memorial Hospital. The Cancer Liaison Program is an integral part of the Commission on Cancer of the American College of Surgeons.

George E. Magnin, MD, received the third Marshfield Clinic Heritage Foundation Award in September for his accomplishments and service throughout the years. He has been described as a gentleman, scientist, a master teacher, coach, mentor, a giant of a physician.

Richard Roberts, MD, JD, President-Elect of the American Academy of Family Physicians, was a panelist at the June 6 debate to ask presidential candidates' health advisers about primary care in Washington, DC.

Steven R. Sirus, MD, a family physician at St. Luke's Franklin Health Care Center in Franklin, was honored for 15 years of membership in the American Academy of Family Physicians.

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In Remembrance

Hart, Catherine K., MD, 43, of Elm Grove, passed away September 21, 2000. She earned her medical degree from the Medical College of Wisconsin, Milwaukee, and completed her residency in diagnostic radiology at the University of Kansas, Kansas City, KS. She was affiliated with St. Michael Hospital in Milwaukee.

Doctor Hart is survived by her husband, Randi, family and friends.

O'Neill, Philip B., MD, 85, of Milwaukee, passed away September 16, 2000. He earned his medical degree from the University of Pittsburgh, Pittsburgh, PA, and completed his internship at Mercy Hospital, Pittsburgh. He completed his residency at Lahey Clinic in Boston and in Cook County in Chicago.

Doctor O'Neill practiced for over 44 years in Milwaukee and was on the staff of Columbia Hospital, St. Marys Hospital and Milwaukee County Hospital. He was a Clinical Professor of Medicine at Marquette Medical College and also published articles for medical journals. He was a fellow in the American College of Physicians, member of the American Gastroenterology Association and the American College of Gastroenterology.

Doctor O'Neill is survived by his wife, Betty.

AMA Awards

The SMS member physicians listed below recently earned the AMA's Physician Recognition Award. They have distinguished themselves and their profession by their commitment to continuing education, and the SMS offers them its congratulations.

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Recognizing and Responding to Elder Abuse

Melissa M. Stiles, MD; and Dulce A. Perez, MS

Statistics

The American Medical Association defines elder abuse or neglect as "an act or omission, which results in harm or threatened harm to the health or welfare of an elderly person." The forms of abuse include physical abuse, neglect, self-neglect, psychological abuse, or material abuse (financial exploitation). Elder abuse is associated with a higher mortality and increased health care costs due to a higher frequency of office and hospital visits.[1]

Elder abuse affects approximately 1.3% of the nation's elderly per year. According to the 1999 Wisconsin Bureau of Aging and Long Term Care Resources, a total of 3257 cases of suspected abuse and neglect were reported in 1999. This represents a 6% increase of reported cases since 1998. Over 1 in 11 (9%) involved either a fatal or life-threatening situation. Nine of the reports were fatal and 363 were considered life threatening. In 1999, approximately 79% of the reported abusers of the elderly in Wisconsin were family members. Spouses were identified as the abuser in approximately 16.8% of the cases. Adult children were identified as the alleged abuser in approximately 46% of the cases.[2,3,4]

Doctor Stiles is an Associate Professor of Family Medicine at the University of Wisconsin Medical School. Ms. Perez is Program Manager and Co-trainer for the Intimate Violence and Sexual Assault Grant with the University of Wisconsin Medical School.

Physician's Role

Physicians can play an integral role in prevention, identification, assessment, and management of elder abuse. Prevention begins with screening questions, which can be asked at routine appointments, or if there is a suspicion of elder abuse. The questions should be non-threatening and asked in a variety of ways to pick up the different forms of elder abuse. Table 1 includes some examples of routine screening questions.[5]

Risk Factors

Awareness of risk factors increases the chance of identification. Risk factors include advanced age, increased dependency, social isolation, dementia and behavior issues. Alcohol use by either the elder or the caregiver is a risk factor. Caregiver risk factors also include mental illness, lack of social support, financial dependency, and external stressors (i.e. job, family, finances).[6]

Red Flags

During the visit there are a number of behavioral and physical signs, which raise the suspicion of elder abuse. Behavioral signs on the part of the family member or caregiver include insistence of being present for the entire visit, answering for the patient, absence of assistance, indifference or anger. Elder behavioral signs can include fearfulness toward the caregiver, poor eye contact or hesitation to talk openly. The history should include

Table 1. Routine Screening Questions for Elder Abuse

- Are you afraid of anyone at home?
- Are you alone a lot?
- Has anyone at home ever hurt you?
- Has anyone taken anything that was yours without asking?
- Does anyone at home make you uncomfortable or afraid?
- Has anyone ever forced you to sign a document that you did not understand?
- Are you kept isolated from friends or relatives?

Table 2. Physical Signs of Elder Abuse

General: Weight Loss, Dehydration, Poor Hygiene

HEENT: Traumatic Alopecia, Poor Oral Hygiene, Absent devices such as hearing aids, dentures, or eyeglasses

Skin: Hematomas, Welts, Bites, Burns, Pressure Sores, Bruises

Genitorectal: Inguinal Rash, Fecal Impaction

a mental health screen with particular attention to depression, anxiety, insomnia and alcohol abuse. Physical signs, which may signal neglect, include contractures, subtherapeutic levels of drugs, malnutrition, dehydration and poor hygiene. Physical signs, which may be caused by neglect or physical abuse, are listed in Table 2. [6,7]

Documentation

Documentation should be precise and thorough as it may be used in guardianship hearings or, possibly, in criminal trials. Documentation begins with a description of the abusive event or neglectful situation using the patient's own words whenever possible. The chart should include a complete medical history, relevant social history, and a detailed description of any injury. If available, obtain photographs of the injury.The assessment should include an opinion as to whether the injuries were adequately explained. Pertinent laboratories or x-rays should also be included.

Management

Safety assessment is paramount in the management of elder abuse. Is the patient in immediate danger? If so, acute hospitalization may be indicated. What steps can be taken to increase safety by utilizing community resources and social support? Management should include measures to decrease social isolation and caregiver stress.

Reporting Requirements

All 50 states have legislation that protects elderly victims of abuse; 42 states have mandatory reporting. Wisconsin has voluntary reporting, which preserves the competent elders autonomy. The goals of reporting include verification of the reported/suspected abuse, gathering information and development of a care plan. The primary goal is to utilize the least disruptive action to maintain the patient in the least restrictive environment.

Resources

Wisconsin Elder Abuse Helpline. Physicians should become aware of the local resources in their community. Doctors can greatly influence how elders use services and they can make a difference in whether the elder can get help or not. A telephone helpline has been established by the lead elder abuse agency in every county in Wisconsin for reporting suspected cases of elder abuse. Lead agencies must contact the patient within 24 hours of receiving a report (excluding weekends and holidays) and within 5 working days of receiving a report of material abuse.

Victims can also be referred to the local domestic abuse program or sexual assault victim services provider.

The elder person may benefit from a variety of services or assistance from the lead elder abuse agency. These include health care, criminal justice (including victim witness programs), aging (including transportation, nutrition and benefit counseling), domestic abuse, sexual assault and/or religious organizations. Under Wisconsin law, the patient may refuse services or entry into their home. In the event that there is enough evidence of severe danger or competency and there is enough compelling state interest, then the lead agency will notify the appropriate law enforcement agency.

Elder Abuse, Neglect and Family Violence: A Guide for Health Care Professionals. This is an invaluable resource for any physician that works with patients over age 60. (Wisconsin Coalition Against Domestic Violence)

Wisconsin Department of Health and Family Services' Bureau of Aging and Long Term Care Resources. This is the leading elder abuse directory.

Acknowledgements

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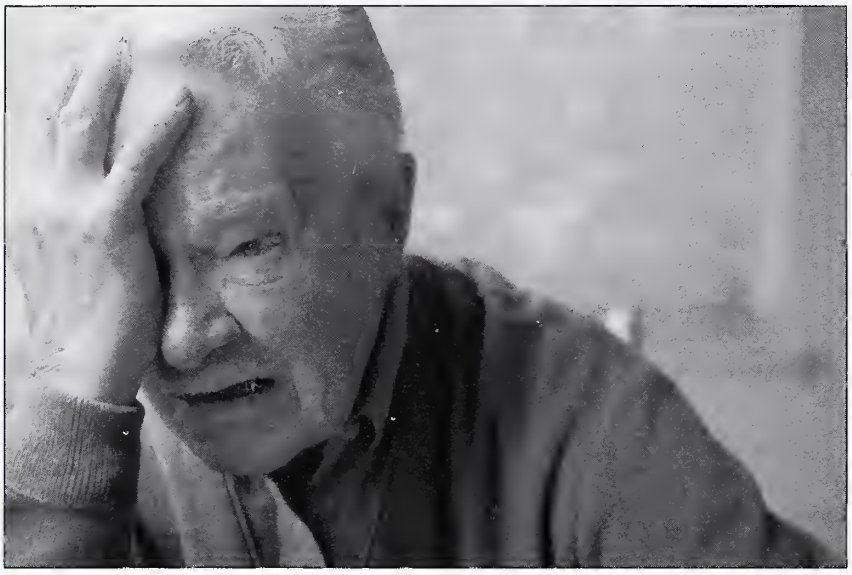

The Subtle and the Overt:

Identifying Elder Abuse

by Marc Kennedy, special to WMJ

From 1998 to 1999, the incidence of reported cases of elder abuse in Wisconsin rose 6 percent, from 3073 to 3257, according to statistics from the state Bureau of Aging and Long Term Care Resources. The records also indicate that these figures have slowly increased since 1990.

Is elder abuse increasing, or is the system of reporting becoming more sophisticated? Experts think it's a little of both. They also believe that elder abuse will continue to be an issue for years to come as the cohort of Baby Boomers age. The aging of this cohort in turn raises further questions: Where will they live, receive assistance and medical care, and who will provide these services? The answers, or lack thereof, will likely affect the level of elder abuse in the decades to come.

"There has been better reporting of elder abuse the past few years, but the number of elderly who are living longer keeps rising as well," said Harry Prosen, MD, Professor and Chair of Psychiatry & Behavioral Medicine at the Medical College of Wisconsin. "Facilities are becoming increasingly expensive as well, and in this economy, it is hard to get quality help. And, it is hard to find low-cost providers with quality care. So the opportunities for abuse are there.

"Elder abuse can occur anywhere," said Prosen. "From the home, when a younger relative is looking after an older one, to a nursing home. Rarely is it deliberate. More often, abuse comes out of frustration or not taking care to adjust the environment to specific needs of the elderly person."

Types of elder abuse include mental and financial as well as physical.

"Financial abuse can occur by family, acquaintances, caretakers," said Paula Hensel, RN, CS, FNP at the Marshfield Clinic's General Internal Medicine Department. "Often they are living with the older person, and it is a situation in which they borrow money saying, 'I'll pay you back'."

Some of this behavior may occur infrequently and be rather innocent, added Hensel, but when it occurs consistently, there is a problem.

"The elderly traditionally don't want something for nothing," she said. "In a nursing home I visit, we have a man who wants to leave a dollar for every meal even though we've explained to him often that it's OK, it's already paid for. He still does it every time. There are those who would take advantage of this type of behavior."

The elder may be suffering from memory loss, or they may fear they may be left alone if they don't continue to "lend" money to the person caring for them. Unfortunately, many cases are not so subtle.

"Some caretakers or relatives may be forcefully preventing the elderly person from spending money," said Hensel. "We have found elderly people locked in rooms where they had to stay all day. Some have been deprived of appropriate care because the family doesn't want to spend the money. Certainly there are cases in which personal motivation is involved. Relatives sometimes fear that if grandma spends all her money on a nursing home, there won't be anything left in the will for them. "

Other times the relatives or caretakers believe they are acting in the best interests of the elderly.

"Some people don't realize there are options," added Hensel. "They are worried that grandpa might lose the farm. But they don't understand that the law has changed, that the elder relatives can protect their property. We need to educate family members better, to let them know that there are financial counselors available through state departments.

Neglect or Abuse?

It is not always easy to determine whether there is inadvertent neglect, according to Hensel. Health care professionals need to help caretakers and family members be aware that the elderly can be disguising early signs of dementia and Alzheimer's.

"From my experience people are often able to hide their declining functions," she said. "Often family members don't perceive the problems. Deep down inside there may be denial; they don't want to believe it. And, in most instances, their older relative looks and acts normal. They can carry on conversations, they appear fine."

In these cases, it takes a little more digging to ascertain whether or not there are problems associate with memory loss.

"When you start getting more specific, you can start getting an idea if they are OK. You ask 'did you eat lunch today? What did you have?' When the response is 'I can't remember,' then you can begin to get a handle on the extent of the problem."

Many elder Americans were brought up in the Depression and have learned self-reliance. They are not comfortable complaining. They are strident about maintaining their independence, at times to the detriment to their health.

"If family members are not around all the time, it's hard for them to know how safe conditions are in the house," explained Hensel. "I know of one elderly person who demanded that she stay on her own in her house, despite several ambulance calls to her home. It wasn't until she burned herself badly that she relented and moved into an appropriate living arrangement where she was safe."

"The key for health care providers and family members is to get into the home and see first hand how the older people are functioning," said Hensel. "We had one horrible incident with an elderly couple that seemed to be doing fine. They had a wood stove, but would start it with lighter fluid. They were with it enough to call for help, saying that they had burned themselves, but they did not say that the house was on fire. They burned to death."

Much abuse is inadvertent. Still, in some cases, abuse is not accidental.

"When an elderly patient comes in, the physician should be looking for bruising, signs of abuse," said Prosen. "We need to also get an idea about financial affairs. We need to be discreet and diplomatic when making these inquiries, we should try to do so without asking personal questions, using a tone of polite curiosity. But we should also be on the lookout and to be particularly aware if a patient complains about a bruise or a fall. If you have reason to suspect something is wrong, the next step is to call the family to see if there is a reason to suspect. If so, you need to report it to a nearby social agency."

Prosen added that sexual abuse is unusual, but it does occur.

"Frequently it is between the elderly themselves in nursing homes or assisted living facilities, often involving confused older men," he said. "Nonetheless, it can be frightening, especially to people who are suffering from dementia."

Physical Abuse at Home

Some older people may be losing control over their emotions or reactions, and over time this may provoke a violent reaction from a relative or caretaker.

"This can lead into physical abuse at home," said Hensel. "Family members can't control their actions. Sometimes it's a result of no respite, sometimes it isn't. We as health care providers need to be cautiously suspicious. We need to view elder abuse like we treat child abuse. When we see something suspicious in the ER, black eye or finger print on arm, we always need to be considering — is this an abuse mark or is there another explanation?

"Certainly there are rational explanations. The mind won't let the body get up and go like used to. But we still have to question whether the person is truly falling that much or are they being pushed or shoved? In nursing homes every bruise should be reported. There isn't that type of supervision for the elderly at home. So, we always have to be a little suspicious."

Mental Abuse

Hensel said she sees more elder abuse and neglect as EMS director for the Pittsville Volunteer Fire Department.

"When you spend enough time with people, they let their guard down," she said. "I see it more when I'm in the community, and I see how the elderly person and the caretaker interact with each other. That is sometimes hard to pick up. It may be how the elderly person responds when you ask them about how things are going. Their responses may be tearful, or they might say something like, 'I'm just stupid, can't do anything right.' Those types of responses are red flags for me."

Many elderly fear that if they become bothersome, they will be thrown out — of the home by the caretaker or of the nursing home.

So they try to hide that they are becoming incontinent.

"These are also self-esteem issues, pride issues," said Hensel. "People don't want to admit that they need help caring for themselves. Independent people don't like to depend on others. So we have to help them make that decision, convince them that it is the best thing to do, to move into a Community Based Residential Facility (CBRF) or an assisted living home. It can be a healthy adjustment, but it is an emotional issue."

Discussing specifics can help the older person understand when it is time to move into more safe environs.

"We spend time talking with patients about whether they are paying bills, how they are getting groceries," said Hensel. "Since my patient clientele comes from couple of hundred miles away I like to use visiting public health nurses or social workers to make sure that people are doing well and good food is in fridge. Many of these folks survived the Depression and don't want to waste anything. So we need sometimes to convince them that it's OK to throw something out. Some older people collect everything, so fire safety and accessibility can be issues. We have to convince them to remove the clutter, and sometimes toss away that old throw rug because they can slip on it. Can an ambulance get in and out of the property? Can medical personnel get a gurney to the second floor? Some of these old farm houses have stairs that are nearly vertical."

Nursing Home Abuse

While Prosen agrees that abuse can occur at home, nursing homes concern him more.

"It is less prevalent in assisted living situations, because residents are in better shape, they can communicate if something is wrong or bothering them or they need something," said Prosen. "Also, keep in mind that there is not a correlation between the amount of money spent on nursing homes and the quality of care, especially if the patient has some aspect of dementia.

"In bad nursing homes," Prosen added, "patients who are difficult to deal with can be neglected. Severe abuse is uncommon, but many patients can get 'polite' abuse, such as being the last to be taken to an event, or being allowed to snooze in a wheelchair instead of being put to bed; being left alone all day, unsupervised. In these instances, staff are not well-trained."

In many cases, there are not enough staff — well-trained or not — to properly address all the needs of residents. This reflects the low unemployment rate, which has led to be a chronic shortage of personnel in health care, especially nursing homes.

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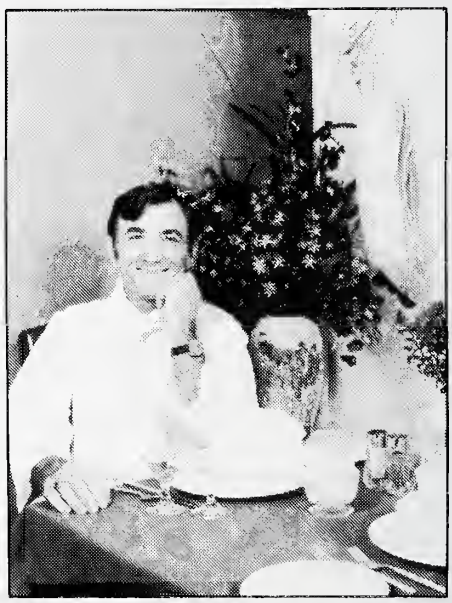

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"With the staffing shortages in the health care industry, there isn't any facility unaffected, whether hospitals or nursing homes," said Prosen. "We need to know about the background of people who get jobs in elderly care situations. There have been frightening stories in the Milwaukee area about people with no training, and some with criminal records, who are not qualified to care for elderly patients and take advantage of them."

Prosen was quick to add that there are many good and excellent care facilities, but said most of these are hard to get into. For those relying on Medicare and Medicaid, there are far fewer options.

"There are not many good places available to them," said Prosen. "Many have been de-licensed, re-licensed, under new management, and excuses made about lack of consistently adequate care, but many problems persist. I tend to try not to make blanket assumptions about nursing homes and elder care facilities. I'm cautious and a little cynical. This helps me protect my patients, not just make arrangement through family and social worker and then wash my hands. I think physicians must be involved."

"When I am assessing a facility, I will often contact the executive director," Prosen said. "This can often provide excellent clues into how well the organization runs. You talk with that person and find out if they are well-trained in nursing or social work, get some background experience from them, find out about staffing—how much per patient they have. Also, how many patients are there, how they feel about the place, and importantly, what the morbidity and mortality rates are."

That information is a good place to start, Prosen said. He also will contact physicians who have referred patients to that facility.

"I would absolutely talk to the doctors who have visited there regularly," he said, "I wouldn't send my patients out into the wild blue yonder."

"We need to ask ourselves are these homes with good programming and support built into them, what kind of care will patients be getting, how present are the family members," he said. "There are homes with good services where people get attention they need everyday, and there are some where they will become isolated. They will deteriorate at a home like that."

Addressing elder abuse

Identifying elder abuse is not necessarily easy. The perpetrators may have coerced the older person into submission, so the victims are afraid to talk. Neglect may be inadvertent or self-inflicted. Many older people try to hide any

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onset of reduced functionality, such as evidence of Alzheimer's, memory loss or an inability to perform routine tasks.

When a physician examines an older person, whether during a regular examination, in the emergency room or the hospital, experts look for certain clues.

"I look at physical status first," said Hensel. "If someone you know has always been neatly dressed and well-groomed, look for that. Then overall hygiene, weight, health. I check their gait for signs of limping or discomfort.

"Then I start asking questions, in a friendly, non-threatening way. For example, if the person is living alone most of the time, I'll ask 'how are you getting your clothes washed?' or how are you getting your groceries?' 'Do you have safety rails in your bathroom?'

Are you still making your own meals? When you are finished, do you have enough strength to eat it? When I find an elderly person has diarrhea, I wonder about food storage and prep. Many older people save everything, and sometimes the food goes bad.

"I know doctors do not have a lot of time, but you can palpate an abdomen and ask these questions at the same time."

The key is to get the older patient to open up.

"You learn a lot of it is in the approach," she said. "You don't walk into a room and say 'hey you're 95, time to go to a nursing home. There are subtleties in dealing with these issues. It is also important to get the family involved."

Relatives may be unaware of difficulties because the older people tend to be somewhat stoic, not wanting to "bother" anyone, and many cling steadfastly to their independence. They worry that once someone thinks there is something wrong with them, they'll get locked away in some sterile institution. By bringing family members in on the discussion, health care providers can help clear the air as well as discuss options available that the elder can accept.

Physicians need to consider the caregivers as well as those for whom they are caring.

"By getting the family involved, we can discuss their issues as well," said Hensel. "How are you doing? Can you manage? Are you getting breaks? How are you managing financially? Abuse and neglect tend to happen when caregivers are burning out, when fuses are getting shorter. Caregivers may not even realize they are doing it. We discuss the various resources available, even meals on wheels."

Taking the Team Approach

Taking a little extra time with the caregivers can offer physicians a wealth of information about the elderly patient as well as the dynamics in which they live. But Hensel warns physicians not to try to do all this on their own

"Caregiver health is an important aspect," she said. "Doctors can only see so many patients each day. So they can rely on social workers, public health nurses, advance practice nurses, whomever is available. We need to look at this as a team of lots of players.

"We need to be advocates for the elderly and their families. I think it's an area where need will be greater in the near future. Things are stretched rather thin now. We're fortunate here in central Wisconsin where we have facilities, but sometimes there is no room at the inn."

There is a "community options program" through the state that funds low income people for group homes. But there is no money in the state-run COP program currently, so the indigent end up in nursing homes at twice the cost instead of CBRFs or assisted living homes, which the federal government pays. And, there is a four-year waiting list to get into to one of these facilities.

How much conditions will improve is up to caregivers, medical professionals, legislators and the patient public. How much they can alter the future for elders in America is unclear.

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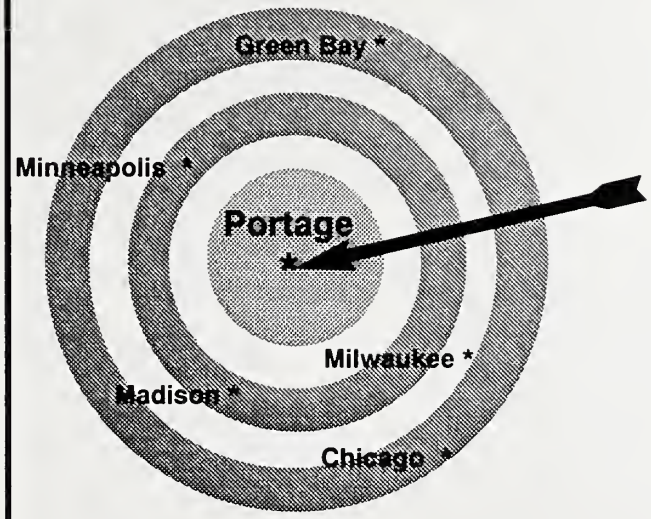

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Fountain of Youth

as Exclusive as Ever

by Marc Kennedy, special to WMJ

There is no easy solution; no quick pill to take to ensure lasting youth or even retard the aging process significantly. A balanced diet, proper exercise, the appropriate amount of sleep, absence of tobacco use and moderate use of alcohol all can help a person live longer. Of course, being born with the right genes doesn't hurt either.

Still, there continues to be plenty of activity, both scientific as well as spurious, dedicated toward discovering compounds that will enhance and prolong life.

"There is a lot of interest, among all age groups, in using vitamins and supplements," said David Watts, MD, geriatric specialist at the University of Wisconsin Medical School and UW Hospital in Madison. "One fairly prominent theory of aging is the oxidative stress hypothesis. This is based on the fact that as organism we generate oxygen free radicals, which can build up unless they are cleansed. So, there is some interest in anti-oxidants as in the anti-aging process. Most commonly, these anti-oxidants are vitamins E and C. So, can we today recommend that people in their middle years or even older persons take these vitamins?

"The short answer: No. There really is no basis for recommending either C or E as a general preventive. We do need the vitamins. It seems that those who eat diets rich in vitamins, via fresh fruit and vegetables, have better health status. So, by eating better, we may be benefiting in our overall health and in the aging process. But when we try to replace what is in a natural diet of fruits and vegetables with a pill, it doesn't confer the same results."

This is nothing new, added Watts. Food scientists have struggled with attempting to capture the nutritional essence of various vitamins and compounds for decades.

"It seems that healthy fresh foods involve a lot of different anti-oxidants, and we are not yet smart enough to replace these good things in a pill," he said. "We seem to be interested in a quick fix. We eat bad food and try to replace what we are missing with a pill, trying to make up for self-imposed nutritional impairment.

"Fresh food is a collection of many different substances," continued Watts. "If we provide vitamin E as a supplement in a pill, we are offering only one form of it, and it is not the natural one. The vitamin E we buy in store as a gelatin capsule consists of alpha-tocopherol in this. But the natural-occurring element is gamma-tocopherol."

Studies support this, as outlined in the following quote from an article on vitamin E: "Despite the promise of antioxidant supplements, cardiologists have not embraced their use, chiefly because results of prospective trials have not been conclusive. It appears that the reason for these inconsistencies may reside in the make-up of vitamin E itself, which

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consists of 2 structural forms, alpha-tocopherol and gamma-tocopherol. The latter form is found primarily in dietary sources, and the alpha form is the one used in vitamin E supplements." (Nurses' Drug Alert 23(12):89, 1999. © 1999 M.J. Powers & Co. Publishers)

Still, Watts is not too quickly forsaking the potential value of vitamin E. Though medical researchers have yet to undeniably prove it, Watts and other physicians have a hunch that there is something to vitamin E.

"My colleagues in geriatrics and I do take a daily dose of vitamin E," he admitted. "It doesn't seem to be harmful, and there might be something to this anti-oxidant theory of aging. Other studies have shown that people who are developing dementia or Alzheimer's in early stages seem to slow it down by taking high doses of vitamin E."

According to a study Watts and colleagues conducted, about half of the geriatricians in the nation take vitamin E.

"There is really no consensus at this point," he explained. "Most geriatric specialists who do take it are not taking high doses of E. About half of them are taking about 400 units per day. That's about one capsule. Can we translate that to our older patients? This we don't yet know. The most reasonable recommendation is to eat a healthy diet."

The jury is still out on using multi-vitamin supplements as well, said Watts.

"When we surveyed geriatricians, about half took a multi-vitamin tablet," he said. "Even though there are not high amounts of any substance in these tablets, you do get a lot of potentially beneficial things. Also, you get folic acid, which can improve homocysteine levels related to coronary artery disease; vitamin D has independent benefits to helping people maintain balance, prevent falls as well as osteoporosis. So in a way, taking a multi-vitamin is like having a small security blanket. But still the best thing is eating a healthy diet consisting of unprocessed foods, as our ancestors did. We try to make up for this with supplements, with the quick fix, but it still isn't the same."

Diet for Elderly Key

Although a balanced diet for older people is critical, according to Watts, for people living alone, it can be difficult to maintain

"It's not always easy to prepare a well-balanced meal for one person," said Watts. "An older person may not eat the quantity or diversity of foods necessary to keep healthy. Also, they may not have the energy to cook the right foods, or have the means to afford the amount and type of food they need."

One vitamin older people need to make sure they ingest is vitamin C.

"We need it to prevent scurvy," said Watts. "So older people need to have access to fresh fruit. But as a means of preventing aging, studies show supplements containing vitamin C haven't done much. As an anti-oxidant, vitamin C may fit in with this theory of aging. There just isn't much proof so far to indicate this. In our study, about 30% of geriatricians took it."

Non-vitamin Supplements are Promising

Various non-vitamin supplements now available on the market are slowly winning over consumers and medical professionals alike, though again, real evidence is scant.

"Take glucosimine and chondroitin, for example," said Watts. "A large number of people are taking it, but there is not a lot of data that strongly supports that it makes a huge difference in fighting arthritis. Some people do benefit though, so many internists, rheumatologists and orthopods will recommend it to certain patients, with varying degrees of success and enthusiasm. Many find that there are enough patients who do well and claim that it has curbed their degenerative osteo-arthritis that they will continue to recommend it.

"The same for ginkgo. It is supposed to help memory loss. The ginkgo tree does contain a complex array of compounds with many anti-oxidants. And again, a few people will say they gain some real benefit. Like most doctors, I will at least agree with patients who try it on their own. It's fairly harmless otherwise, and if it makes them feel good..."

No Fountain of Youth

Watts admits that ensuring a person has sufficient levels of vitamins such as C and E in their system can help overall health. But whether they retard the aging process, there simply is not enough medical evidence. However, this doesn't prevent physicians from hedging their bets.

"Most geriatricians who regularly take vitamin E do so as an insurance policy, believing that it might be beneficial," he said. "But as a preventive, there is scant information that it is at this point."

And despite the claims of cable TV ads and ancient recipes for mysterious elixirs, there really is no secret formula for extending the inevitable.

"Unfortunately, there is no magic bullet or fountain of youth," said Watts. "The only intervention that has shown to extend life significantly in rodents or primates is severe dietary restriction. And, who wants to hear about this in Wisconsin?"

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Why Older Age Predicts Lower Acceptance of Physician-Assisted Suicide

Jan Hare, PhD; Dennis Skinner, PhD; and David Riley, PhD

ABSTRACT

Background: Prior research has shown that older Americans have less accepting attitudes toward the legalization of physician-assisted suicide (PAS).

Objective: The current study tests nine explanations for why older Americans are less accepting of PAS.

Design: Survey questionnaires in two settings: a small rural community and an internal medicine clinic in western Wisconsin (n=1,311).

Results: Overall, 57% of this sample supported legalization of PAS while 31% opposed and 12% were in the middle. Two of the nine factors significantly (and negatively) predicted attitudes toward PAS: religious beliefs and belief that life's transitions have value. One factor is shown to mediate the relationship between age and PAS. Older subjects' greater focus on religious beliefs was able to significantly explain their lower levels of acceptance of PAS, as compared to younger subjects.

Conclusion: Findings from this study support other PAS studies, which indicate that most Americans support the legalization of PAS. More importantly, it clarifies the role of age—that is, age is not important in and of itself. Rather, it is important as a predictor of religious beliefs which in turn predict negative attitudes and unique influences on the thinking of American adults concerning the legalization of PAS.

INTRODUCTION

The literature on physician-assisted suicide (PAS) can be divided into two categories: conceptual papers that heatedly debate the morality of such a practice[1–6] and empirical papers that investigate attitudes toward legalization of the practice.[7–9] This latter category grew rapidly after the first passage of the Oregon "Death With Dignity Act" in 1994 and has been growing again since the second Oregon vote in 1997 and implementation of the law, particularly studies which examined physician attitudes toward PAS.[10–15] Several studies suggest that the majority of Americans support physician-assisted suicide.[7–9, 12, 16]

To date, we lack a clear understanding of what influences the thinking of Americans with regard to the legalization of physician-assisted suicide. This study aims to develop and test a model which is predictive of attitude toward PAS. A review of the literature provides support for the hypothesis that the following variables are significantly influential in predicting an individual's attitude toward PAS.

Age: A few studies have found a significant relationship between age and support for PAS. However, findings are inconsistent. For example, a 1992 survey of the general public found that 70% of adults aged 18–34 showed support for allowing physicians to end the lives of terminally ill patients if the patients or their families requested it whereas only 54% of those over age 50 showed support.[8] In a study of attitudes of Michigan physicians and the general public toward PAS, significant differences in attitude toward assisted suicide existed by age for physicians, but not for the general public. Specifically, older physicians were less likely to support legalization of PAS.[7] On the other hand, another study investigated the willingness of Oregon physicians to participate in PAS if it was legal and found a significant positive relationship with age. A 13% increase in willingness to participate was found for each 10-year increase in age.[11]

Ethnicity: Two studies of the public found racial differences with respect to PAS attitudes,[17-18] revealing that whites were consistently more likely to support the legalization of PAS than were blacks.

Education: No studies were found which tested for educational difference with respect to attitude toward

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PAS. However, this socio-demographic factor is consistently a powerful marker of a wide variety of attitude differences in the United States population. Therefore, we considered it an important variable to include in the model.

Religious Beliefs: Many studies provide evidence that religious beliefs are an important correlate of attitudes toward PAS. These studies, sampling physicians, medical residents and the general public, consistently show an inverse relationship, e.g., more highly religious respondents are least likely to favor PAS.[7–8, 11, 13–15, 19–20] Religiosity was measured in a variety of ways, including religious affiliation, being influenced by religious beliefs (yes vs. no), frequency of prayer, and the importance of religion in one's life.

Access to the Health Care System: Caplan[21] argues that legalizing PAS is unwise in the United States where 20% of the population has no health insurance, stating that it is not possible to argue the "right to be killed by your doctor before you've established the right to be treated by a doctor." No empirical papers have investigated this variable in terms of predicting attitude.

Individual Rights: Proponents of PAS often rely on individual rights to argue a terminally ill patient's right to PAS. While many conceptual papers discuss patient autonomy/individual rights in the context of PAS,[3,22–24] only one empirical study has measured its influence on attitudes toward PAS and found it to be a significant positive predictor of attitude toward PAS in a sample of college students.[20]

Concern About Vulnerable People: Opponents of PAS often voice concerns for patients who may be harmed by the legalizing of PAS, particularly the frail elderly who may not have someone to care for them or minority groups who historically have not been well served by the health care system, as well as others perceived as vulnerable by some kind of disability.[25–28] Proponents of PAS also mention concern for vulnerable populations in discussions of appropriate safeguards.[29–30] Again, no empirical papers have yet tested this idea.

Valuing All Life's Transitions: While no empirical evidence has been reported, some scholars argue that all life experiences have value and therefore PAS is wrong in the sense that it deprives terminally ill patients and their families an opportunity to grow through life's final transition.[31-32]

Pain, Being a Burden to Others, and Dignity: As opposed to the argument that all life's transitions have value, other scholars write that there is nothing intrinsically valuable about suffering, whether that suffering is physical or psychological, such as feeling that one is a burden to others or that personal dignity has been lost. Many conceptual papers draw these three concerns together (pain, being a burden to others, and dignity) to argue in support of PAS.[29, 33–36] In addition, a few empirical reports have found these to be significant concerns of the general public,[8] as well as patient concerns as perceived by physicians.[10,16]

Previous Experience: Only a few studies have considered an individual's previous experience with a terminally ill person in terms of influencing attitudes toward PAS. For example, one study[7] found that among physi-

Table 1. Sample characteristics, n=1,311

Gender	60% female, 40% male
Age	X=39, s.d.=18.0, range=1896
Age Categories	18-29 = 40% (509) 30-49 = 33% (416) 50-64 = 15% (194) 65-96 = 11% (145)
Ethnicity	Caucasian=94% (1,148) African-American=1.5% (18) Asian American/PI=1.6% (19) Hispanic=1.4% (17) Native American=1.0% (12) Biracial=.3% (4)
Marital Status	Single/never married=39% Married/partnered=49% Divorced=7% Widowed=5%
Religion	Protestant=37% Catholic=34% Protestant/Evangelical=12% Hindu=.2% Buddhist=2% Jewish=.5% Islam=.1% Other=5.0% None=9%
Education	8th grade or less=3% Some high school=3% High School Graduate/GED=19% Tech School=10% Some College=38% College Degree=18% Grad Degree=6.0% Post Grad/Professional Degree=3%
Health	Excellent=30% Good=54% Fair=14% Poor=2%

Table 2. Sociodemographic and Self-Perceived Influencing Factors

Socio-demographic Factors
- Age
- Ethnicity
- Education

Self-perceived Influencing Factors
- Not all Americans have access to the health care system
- Being a burden on others
- Personal dignity
- My previous experience seeing another person's dying process
- My feelings regarding pain control at the end of life
- Individual rights
- All of life's transitions have value
- Vulnerable people might be exploited
- Consistent with my religious beliefs

cians as a group, doctors who frequently treated terminally ill patients were less likely to support legalization of PAS, but not less likely to be willing to participate if it became legal. However, a survey of college students found that amount of exposure to a close personal other who was terminally ill was not a significant predictor of attitude toward PAS.[20]

Based upon the literature cited above, this study develops a path model that specifies the influencing factors which predict attitudes toward assisted suicide and who is most likely to perceive that these factors are influential. We remind the reader that there is a difference between holding a strong belief/concern and believing that this concern influences one's attitude toward physician assisted suicide. The focus of this study is on the latter.

METHODS

Procedures: Questionnaires were administered through two data collection sites: 1) through the internal medicine department at an outpatient clinic in western Wisconsin and 2) through administration to acquaintances of upper-division undergraduate students in the health ethics and family policy courses at a four-year university in western Wisconsin.

Both clinic nurses and university students received training by the researchers in recruitment of subjects and administration of the survey. In the clinic setting, nurses explained the study to patients after the nursing intake was completed. Patients were told that only the university researchers would see their completed survey form, and if they wished to participate, they could place their completed form in the box as they left the clinic. A few took the survey home and returned it through the mail. Nurses estimated that fewer than 10% of patients declined to participate. Each patient was given a passive consent form which explained the purposes of the study and guaranteed confidentiality. If patients initiated a discussion of the survey questions, both nurses and physicians responded that they could not discuss the survey questions until after the questionnaire was completed and placed in the box.

Students were required to collect 12 questionnaires, six from other university students or employees and six from outside the university. In general, students recruited subjects from among their acquaintances, friends and family by explaining the purpose of the study and asking if the subject would be willing to complete the form and place it in an envelope. Passive consent forms were given to each subject and students returned completed questionnaires to their professors. Students also reported that fewer than 10% of subjects declined to participate. In addition, students signed a form verifying the authenticity of the data. In order to check for authenticity, statistical comparisons between clinic data and student data were made on attitude toward PAS. No significant differences were found; thus, data from both collection sites were combined.

Criteria for participation in the study included the following: subject must be at least 18 years old; fully competent; able to speak; comprehend and read in English; give verbal consent to complete the survey questionnaire; and currently reside in Wisconsin.

Approval for this study was granted by the University Human Subjects Review Committee.

Data were collected in two waves. In Wave One, 598 questionnaires were collected between October, 1997 and January, 1998. Based upon those findings, changes were made in the measurement of the independent variables. Wave Two was conducted between February and May, 1998, yielding another 713 surveys.

SAMPLE

The total sample for this study consisted of 1311 individuals in western Wisconsin. The majority (84%) reported excellent or good health and 60% were female. Respondent ages ranged from 18 to 96, M=39, s.d.=18. Ninety-four percent (1,148) were Caucasian and less than 30% held college degrees (See Table 1 for sample characteristics).

MEASURES

Sample Descriptors: We measured several sociodemographic variables, which all appeared at the end of the survey (See Table 1): **age**—respondents were asked to give their age in years; **education**—respondents circled their highest level of education using the following categories: 8th grade or less, some high school, high school graduate or GED, technical school, some college, college degree, graduate degree, post graduate degree or professional degree;

Table 3. PAS by Self-Perceived Influencing and Sociodemographic Factors

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1655.434[a]	30	55.181	31.145	.000
Intercept	20.330	1	20.330	11.474	.001
Vulnerable	12.054	3	4.018	2.268	.080
Rel Beliefs	57.891	3	19.297	10.891	.000
Pain	4.968	3	1.656	.935	.424
Experience	2.725	3	.908	.513	.674
Burden	4.147	3	1.382	.780	.505
Dignity	3.463	3	1.154	.652	.582
Transitions	23.737	3	7.912	4.466	.004
Access to HC	4.739	3	1.580	.892	.445
Indiv Rights	3.378	3	1.126	.635	.592
Age	6.591	1	6.591	3.720	.054
Education	2.130E-03	1	2.130E-03	.001	.972
Ethnicity	5.479	1	5.479	3.092	.079
Error	1001.054	565	1.772		
Total	13903.000	596			
Corrected Total	2656.488	595			

a. R Squared = .623 (Adjusted R Squared = .603)

ethnicity—respondents marked one of the following categories: African American, Asian American/ Pacific Islander, Biracial or other, White, Hispanic origin/Latino, Native American Indian/Eskimo; **marital status** was categorized as single/never married, married/partnered, divorced or widowed; **health** was categorized as excellent, good, fair or poor; **religion** was categorized as Catholic, Protestant, Protestant/Evangelical, Jewish, Islam, Buddhist, Hindu, Other, None.

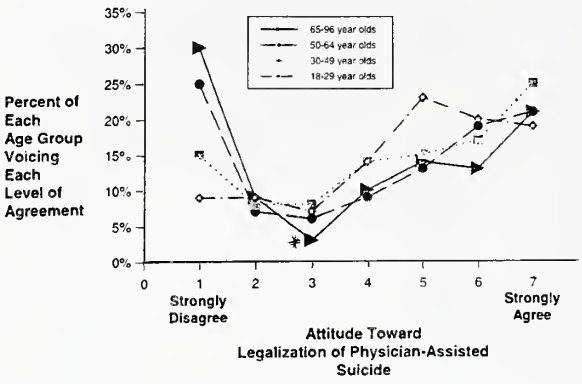
Dependent Variable: Attitude regarding legalization of physician-assisted suicide was measured by a single item utilizing a 7-point Likert scale ranging from strongly agree (7) to strongly disagree (1) with the following statement: *There should be a law which allows a physician to prescribe a lethal medication for a competent terminally ill adult who wishes to end his or her life.*

Independent Variables: Immediately following this question regarding attitude toward PAS, nine self-perceived influencing factors were listed. In Wave 1 respondents were asked to check all factors which were important in guiding their thinking regarding PAS. The majority of respondents checked nearly all factors. Therefore, in order to refine this measure Wave 2 respondents were asked to only rank the top three factors which were most important in influencing their thinking regarding the legalization of physician-assisted suicide. The most important factor was coded as 1, the second most important was coded as 2, and the third most important factor was coded as 3. Those factors not ranked in the top three were coded as 4 (See Table 2 for list of factors exactly as they were worded). Thus, our findings regarding these factors are based upon Wave 2 data only (n=713).

Asking respondents to directly report on the self-perceived factors that influenced their attitude toward physician assisted suicide has the advantage of being a self-report on a causal process. In other words, we are asking respondents not just what attitudes they have (e.g. are you religious?), rather which attitudes guide their thinking about this issue. On the other hand, research has often shown people to be biased judges of the causes of their own actions and attitudes[37-38], so we advise caution in the interpretation of the results of this study.

Data Analysis: The analysis builds from simple to complex: from univariate analysis examining the outcome variable, PAS, to multivariate analysis of variance, to a causal path model which combines several analyses together. Because the independent

Figure 1. Relationship of age with attitude toward physician-assisted suicide.



Note: Of the 28 plotted means, one is based on a sub-sample of fewer than 10 respondents (smallest cell n=5)

variables were measured as rankings, not on an interval scale, analysis of variance was used.

The final model (Figure 3) will be trimmed to include only variables that showed one or more significant relationships. We hypothesize that the self-perceived influencing factors will explain the sociodemographic differences in attitudes toward PAS.

RESULTS

Waves 1 & 2 Data Combined

Attitudes Toward Physician-Assisted Suicide: As reported in an earlier issue of *WMJ* [16], respondents in both Wave 1 and 2 (n=1311) used the full response scale (ranging from 1 to 7) in describing their attitudes toward PAS. The mean response was 4.5 (with a standard deviation of 2.0), just slightly on the "favoring attitude" side of the scale midpoint of 4. If responses of 1–3 are categorized as opposition and 5–7 as in favor of legalization of PAS, then over half (57%) supported the legalization of PAS, while about one-third (31%) opposed it. The remaining 12% were in the middle.

Socio-Demographic Differences in Attitudes toward Physician-Assisted Suicide: The literature review noted two socio-demographic factors (age and ethnicity) that had previously been linked to attitudes toward PAS. We tested these two, as well as education, in a main effects analysis of variance model. The factors were age (4 levels), education (8 levels) and ethnicity (6 levels). (See Table 1 for age, education and ethnicity categories.) Only age emerged as a significant predictor, $F(3,1165)=6.46$, $p<.001$.

To help interpret this finding, we have plotted the full distribution of scores on PAS within the four age ranges in Figure 1. Visual inspection of the figure suggests that much of the age difference in attitude toward PAS is due to far more elderly persons voicing a strong disapproval of PAS. Over one-quarter of respondents over age 50 voiced the strongest possible disapproval of PAS while only about one-eighth of those under age 50 voiced this same strong view. The percentages who had moderate or approving views of PAS were not strikingly different across age ranges.

Wave 2 Data

Test of the Nine Self-Perceived Influences on Attitude Toward Physician Assisted Suicide: The multivariate analysis utilizes data only from Wave 2 respondents (n=713). Table 3 reports the findings from an analysis of covariance including main effects for each of the nine hypothesized influencing factors, with control for the three socio-demographic factors already tested. Two of the factors produced significant effects: the first was that PAS was "Consistent with my religious beliefs," $F(3565)=10.89$, $p<.001$, and the second was the belief that "All of life's transitions have value," $F(3565)=4.47$, $p<.01$.

Inspection of Figure 2 assists in the interpretation of these findings. The first graph shows the mean level of approval of PAS for respondents who checked "Consistent with my religious beliefs" as the most important factor, the second factor, the third factor, or not checked as a factor, in influencing their approval or disapproval of PAS. The second graph shows the same results for the factor "All of life's transitions have value." In both graphs, the key distinction is between those who checked each factor as an influence versus those who did not check it. Whether respondents checked it as the first or third most important factor mattered little, compared to whether they checked it or not.

Note also in Table 3 that the F for respondent's age has been reduced to a level of non-significance ($p > .05$). This fits with the mediational hypothesis that the self-perceived influencing factors might explain the socio-demographic differences in attitudes toward PAS that earlier researchers have found. That is the focus of the final analysis. We follow the advice of Baron and Kenny [39] in testing whether our mediational hypothesis is supported by the evidence.

Testing the Mediational Hypothesis: For the test of the mediational hypothesis, only the variables which have produced significant effects in the earlier analyses are carried forward. As shown in Figure 3, this includes one socio-demographic characteristic, age, and two of the self-perceived influencing factors, "Consistent with my religious beliefs," and "All of life's transitions have value." The question becomes: do differences in the self-perceived influences explain the age trend in attitude toward PAS?

The first model in Figure 3 shows the bivariate relationship of respondent's age with acceptance of PAS. The second model adds the two self-perceived influencing factors as potential mediators, and shows the estimated strength of relationships among all variables. These path estimates are derived from three anova models, the first with PAS as the dependent variable (predicted by the other three variables), and the second and third models estimating the bivariate relationship of age with each mediator variable in turn.

Several findings are evident in this figure. By including the two self-perceived influences in the model, the total amount of variance explained increases considerably, from R-squared=.02 to .60. Second, one of the self-perceived influencing factors is shown to significantly mediate the relationship of age with PAS. This is shown by the significant path from age to the factor "Consistent with my religious beliefs," and the significant path from that factor to PAS. Third, the direct relationship of age with attitude toward PAS is significant in the first model, but not in the second. Thus, we can say that older respondents were more likely than younger ones to report being influenced by their religious beliefs, and this difference explained why older respondents were less favorable toward PAS than younger ones.

DISCUSSION

Our Wisconsin data support earlier research suggesting general public support for the legalization of PAS.[7-9,12] These findings also further document that age is negatively related to support for physician-assisted suicide. Specifically, other studies have found that older adults in the general public[8] and older physicians[7] are less favorable towards laws allowing PAS. The path analysis suggests an explanation for this and enables us to organize the variables in terms of their importance.

We first asked if approval of PAS was related to key socio-demographic categories, as earlier studies have found. Only the age of respondents predicted PAS in this sample, with older respondents favoring it less. In particular, we found that over one-quarter of those over age 50 voiced the strongest possible disapproval of PAS, while only about one-eighth of respondents under age 50 voiced this same strong attitude.

We next asked whether nine self-perceived influences would predict attitude toward PAS. In fact, only two of these (religious beliefs and all life's transitions have value) were found to significantly predict attitudes toward PAS, with religious beliefs being the strongest predictor. Both variables were negative predictors. In other words, when respondents were thinking about whether or not physician-assisted suicide should be legalized, if they perceived their reasoning was based on their religious beliefs and belief that life's transition's have value, then they were less likely to view PAS favorably.

Figure 2a. Importance of "Religious Beliefs" in Influencing Attitude about PAS.

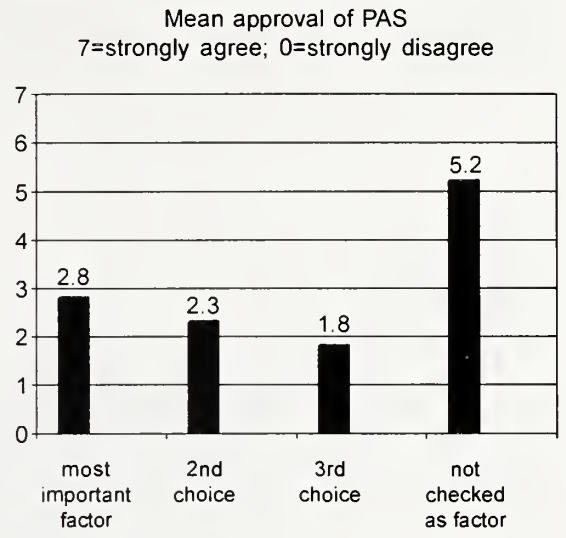
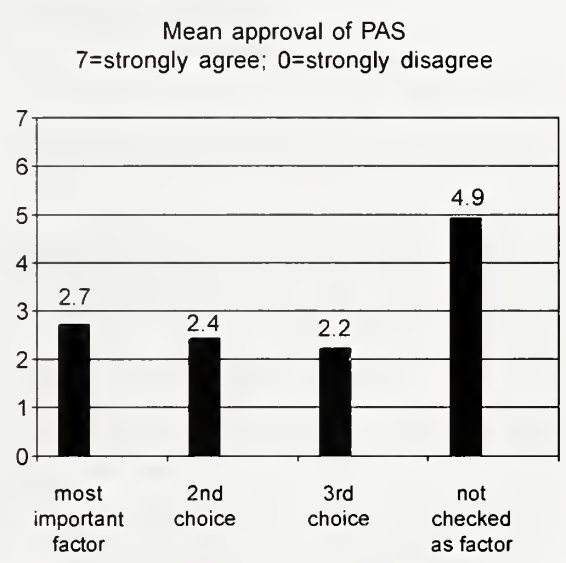


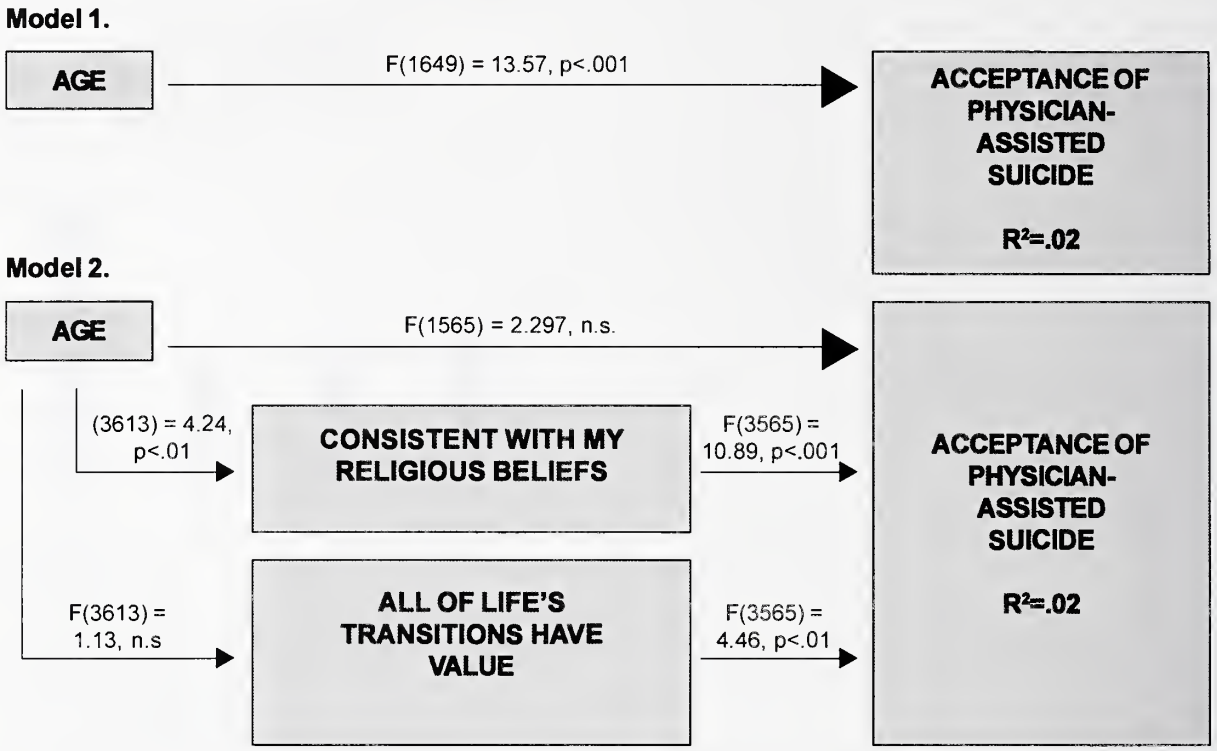
Figure 2b. Importance of "Valuing all Life's Transitions" in Influencing Attitude about PAS.



The mean attitude toward physician-assisted suicide was slightly positive and yet the strongest predictors of that attitude were the self-perceived influences which seem linked to a negative attitude. How do we explain this seeming contradiction? Three explanations come to mind.

Those favoring PAS might differ from each other in their reasons, so that no single rationale (e.g. being a burden on others, or concern for personal dignity) was a

Figure 3



Note: All effects are estimated frmo the full model where appropriate. For the direct paths in Figure 2, see Table 2. Nonsignificant paths and variables have been deleted from the figure for simplicity of presentation.

strong and consistent predictor. If, in contrast, opposition to PAS had a consistent basis, then these influences would stand out as the consistent and strong predictors.

Second, we should remember that not checking an influencing factor contributes just as much to the statistical outcome as does checking the factor as one's top choice. For example, a respondent who reported that religious belief had a minimal effect on attitude toward PAS had just as much effect on the association of those two variables as did the respondent who reported strong guidance from religious belief. This would be consistent with the idea that the absence of religious beliefs opposed to suicide could disinhibit the usual taboo against suicide, leading to a favorable attitude toward PAS. Thus, both the presence and absence of those religious beliefs helps explain attitudes toward PAS.

Our final set of analysis tested whether the self-perceived influences would explain the effects of socio-demographic variables of age and ethnicity found in earlier research. We found that only age was significantly correlated with PAS, as previously noted.[7-8] Furthermore, age was mediated only by religious beliefs. Thus, much of the disapproving attitude toward PAS of older adults can be attributed to their being guided more by religious beliefs than are younger adults. This makes intuitive sense given that previous studies indicate that older people tend to be more religious.[40]

Our findings clarify the role of age — that is, age is not important in and of itself. Rather, it is important as a predictor of religious beliefs which in turn predict negative attitudes toward the legalization of PAS. The relationship of these two variables gives a more accurate picture of the strong and unique influences on the thinking of American adults concerning the legalization of PAS.

It would be most accurate to say that the two self-perceived influences in Figure 3 are important regardless of the person's age. Older respondents were more likely than younger ones to base their attitudes toward PAS upon religious beliefs. But regardless of their age, the adults we studied were less likely to favor physician-assisted suicide if they based their thinking upon religious beliefs and a valuing of all of life's transitions. Clearly, in relation to this topic, socio-demographic stereotypes cannot be relied upon to predict attitude. What matters most are self-perceived influences—

beliefs and concerns—which can be held by individuals in any age, ethnic or educational category. In all likelihood, efforts to change public policy to reflect Americans' support of the legalization of PAS will continue. The findings of this study could guide both proponents and opponents of the legalization of PAS as they seek public support for their position.

Confirmation of the current results, using methods that do not require self-reports of cause-and-effect attributions, would be a useful next step in exploring attitudes related to the legalization of physician-assisted suicide.

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Enterotherapy Associated T-Cell Lymphoma: A Case Report and Literature Review

Robert S. Dieter, MD; and Kristin Duque, MD

ABSTRACT

T-cell lymphoma of the intestine is a form of extranodal, non-Hodgkins lymphoma. Enteropathy associated T-cell lymphoma (EATCL) is a unique form of T-cell lymphoma involving the gastrointestinal tract. This disorder is rare and there is no consensus on guidelines for diagnosis or treatment.

Case: This 47 year old patient presented to the hospital with increasing abdominal girth and swelling of the lower extremities over the four days prior to admission. He complained of dyspnea on exertion, anorexia, nausea and vomiting, 40 pound weight loss over half a year, accompanied by intermittent diarrhea.

On physical examination, the patient was found to have anasarca, an abdominal fluid wave with shifting dullness, mild abdominal tenderness, marked pitting edema of the extremities, and necrotic toes. A small bowel follow through revealed an abnormality in the mid-jejunum and a colonoscopy revealed two erythematous lesions near the cecum. Subsequent esophagoduodenoscopy and enteroscopy identified multiple white patchy lesions in the proximal jejunum. Biopsies were consistent with a T-cell lymphoma. The patient underwent a partial small bowel resection. Biopsies of the jejunum had ulceration and necrosis with a lymphomatous infiltrate. The lymphocytes were found to be a monoclonal CD2 positive T-cell population. A bone marrow biopsy was unremarkable. Enteropathy associated T-cell lymphoma is a rare, and this may be the first reported case of EATCL presenting as anasarca.

Discussion: The etiology and pathophysiology of intestinal lymphomas, particularly enteropathy associated T-cell lymphoma, is reviewed.

Conclusion: EATCL is a rare and unique form of lymphoma without an exact treatment regimen which carries a high mortality rate.

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T-CELL LYMPHOMA OF THE INTESTINE

T-cell lymphoma of the intestine is an interesting form of extranodal, non-Hodgkins lymphoma. Enteropathy associated T-cell lymphoma is a unique form of T-cell lymphoma involving the gastrointestinal tract. This disorder is rare and thus, there is no consensus on guidelines for diagnosis or treatment.

CASE

This 47-year-old patient presented to the hospital with increasing abdominal girth and swelling of the lower extremities over the four days prior to admission. The patient had a history of H.pytori peptic ulcer disease, peripheral vascular disease requiring bypass, and hypertension. He complained of dyspnea on exertion, anorexia, nausea and vomiting, forty pound weight loss over half a year, accompanied by intermittent diarrhea. Five days prior to admission, his stools had become lighter in color and his urine had become darker .

On physical examination, the patient was found to have anasarca with an abdominal fluid wave and shifting dullness, mild abdominal tenderness, marked pitting edema of the extremities, and necrotic toes. Laboratory data on admission was as follows: wbc=6.7 x 10^3/ul, hemoglobin=12.5 gm/dl, platelets=409x 10^3/ul, LDH=144 U/1, total protein=3 g/dl, albumin=1.2 g/dl, cholesterol=217 mg/dl, liver function tests, amylase and lipase were normal. HIV screen was negative. Peritoneal fluid showed albumin<1 g/dl, LDH=27 U/1, wbc=1/ul. An abdominal CT scan revealed ascitis, no lymphadenopathy or organomegaly. Stool alpha-1 antitrypsine was slightly elevated. A small bowel follow through revealed mucosal abnormalities in the mid-jejunum and colonoscopy revealed two erythematous lesions near the cecum. Subsequent esophagoduodenoscopy and enteroscopy identified multiple white patchy lesions in the proximal jejunum. Biopsies were consistent with a T-cell lymphoma, but not diagnostic.

The patient underwent an exploratory laparotomy and partial small bowel resection. Pathological analysis of the jejunum showed extensive ulceration and necrosis with a lymphomatous infiltrate; thus, placing our patient into at least stage II disease. The lymphocytes were found to be a monoclonal CD2 positive T-cell population (TCRβ positive by PCR). The patient had a bone marrow biopsy which was unremarkable for evidence of lymphoma. Initially, the patient was started on CHOP (cyclophosphamide/doxorubicin/vincristine/prednisone) chemotherapy but after the first cycle, he had worsening of ascitis and a computerized tomogram of the abdomen showed omental thickening. Subsequently, his protocol was changed to hyper-CVAD (hyperfractionated cyclophosphamide/ vincristine/ doxorubicin/dexamethasone). However, there is no consensus on what type of chemotherapy is best suited for patients with EATCL. Our patient has survived to at least 18 months after initiation of chemotherapy.

DISCUSSION

Lymphomas represent approximately 5% of all neoplasms, 60-70% of which are of the non-Hodgkin's type.[1] For the past three decades, the incidence of non-Hodgkin's lymphomas have risen by approximately 3-4% per year to a rate of 13.7 per 100,000 individuals in 1989.[2] The greatest relative increase has been seen in the extra-nodal lymphomas.[2] Gastrointestinal lymphomas represent the most common extra-nodal site of lymphoma.[2] The enteropathy-associated T-cell lymphomas make up only 1-2% of the non-Hodgkin's lymphomas, representing roughly one-third of all lymphomas of the small intestine.[3] Primary GI lymphomas can occur in the stomach or less commonly in the small intestine, and are most commonly of B cell origin. In the stomach, most are seen with mucosal associated lymphoid tissue (MALT). In the Western world, most of the small intestinal lymphomas are mantle cell. In developing countries, immunoproliferative small intestinal disease (IPSID) is more common. The majority of these intestinal lymphomas are B cell in origin.[4,5] In a study by Liang of Chinese patients with primary extra-nodal non-Hodgkin's lymphomas involving the GI tract, only 7% of the patients were characterized as T-cell in origin by immunophenotypic methods.[5] Enteropathy associated T-cell lymphoma (EATCL) is the only primary GI lymphoma of T-cell origin. Enteropathy associated T-cell lymphoma was described in 1962 and may have been reported as early as 1937.[6] Originally, enteropathy associated T-cell lymphoma of the gut was described as malignant histiocytosis of the intestine.[7,8] In 1985, Isaacson, et al described four cases in each of which, the neoplastic cells were positive for CD7, a T-cell associated marker.[7] The conclusion was that this was a non-Hodgkin's lymphoma of T-cell origin. EATCL occurs in 7-12% of patients with celiac disease and/or dermatitis herpetiformis.[2,9]

Table 1. Clinical Presentation of EATCL

Median age[4]:	56 years old (range 20-80)
Sex:	fairly evenly distributed
Presenting Symptoms:	Abdominal pain Weight loss (rapid in 33-50%) Perforated intestine Obstruction (generally small intestinal) Intussusception Protein losing enteropathy/malabsorbtion
Hematologic Abnormalities:	Leukocytosis Anemia Thrombocytosis

Table 2. Pathology and Histology of EATCL

Location: jejunum most frequent location

Frequency of diffuse disease at presentation: common

Patterns of mucosal involvement:

Schmitt-Graff

1. intramucosal spread of tumor
2. ulcerated lesions of tumor, without mucosal remodeling
3. ulcerated lesions of tumor with adjacent tumor in flattened mucosal segments
4. bulky lesions with mucosal remodelling

Chott

1. EATCL
2. EATCL-LLWE
3. non-EATCL

Cell types[4,13]:

pleomorphic, medium and large cell
pleomorphic small cell ,
monomorphic medium to large cell
small cells

Furthermore, the distribution of lymphomas in the GI tract can vary somewhat depending upon where in the world the patient lives.[10] For example, in the United States the frequency of small bowel lymphomas outnumber the colorectal lymphomas by about two to one, whereas in India nearly half of all GI lymphomas are colo-rectal in origin.[10]

See Table 1. In a series by Chott of 27 patients with peripheral T-cell lymphoma of the intestine, the median age at presentation was 56, divided fairly evenly between men and women.[4] The majority of patients with EATCL present with abdominal pain and weight loss, sometimes rapid.[4,9,10] An acute abdomen, resulting from either perforation or obstruction is a fairly common presentation of EATCL, seen in at least a third of the patients examined by Chott, and more

Table 3. Association between EATCL and Celiac Disease

Clinical Presentation	
Age of Presentation:	5th-7th decade of life
Symptoms:	malabsorption sensitivity to a gluten containing diet
Pathologic Characteristics	
Location:	jejunum most commonly
Histology:	high number of intraepithelial T-cells monoclonal T-cell expansion villous atrophy
HLA:	associated with HLA-DQ heterodimer

than half of the patients in the series by Isaacson.[4,11] Perforation may be a more common manifestation of EATCL owing to the fact that lymphoma cells do not exert a strong desmoplastic reaction and are thus less resistant to digestive juices.[10] Obstruction tends to occur more frequently in lymphomas of the small intestine than the large intestine and some patients may present with intussusception.[10] Less frequently, EATCL may present as a protein losing enteropathy or malabsorption, though there are no cases reported where this has led to severe hypoalbuminemia and consequent anasarca.[3,8,12] Furthermore, roughly a third of patients present with leukocytosis, a fourth may present with anemia, and a fifth with thrombocytosis.[4]

See Table 2. A review of T-cell lymphoma associated with malabsorption by Isaacson found small intestinal villous atrophy in all of the cases. The disease was most severe proximally, decreasing in severity distally, without regard to the site of the lymphoma.[11] Isaacson reports that two-thirds of patients have diffuse disease with potential involvement of the bone marrow, liver, and the spleen.[11] In the series by Chott, the jejunum was the most common location of multifocal intestinal lymphoma, the majority of these with spread to lymph nodes.[4]

Various categorizations of the involvement of the intestine in T-cell lymphoma have been proposed. Schmitt-Graff, et al described four patterns.[13] The first pattern of T-cell infiltration involves only intramucosal spread of tumor cells, in either near normal or enteropathic intestine. The next pattern is one of ulcerated lesions of tumor and, tumor either in adjacent or distant parts of the intestine without any mucosal remodeling. The third pattern has ulcerated lesions of tumor cells with adjacent tumor in flattened mucosal segments. The final pattern is one of bulky lesions associated with considerable mucosal remodeling of intestinal segments-either infiltrated or not by tumor cells.[13] Chott has classified EATCL according to the lymphomas infiltration and morphology of the uninvolved mucosa into three patterns- "enteropathy associated T-cell lumphoma (EATCL)," "EATCL-like lymphoma without enteropathy (EATCL-LLWE)," and "non-EATCL (non-EATCL)."[4] In EATCL, the spread of intramucosal lymphoma is accompanied by atrophic mucosa, spreading beyond the invasive lymphoma. In the EATCL pattern, the uninvolved mucosa is also atrophic. The EATCL-LLWE type is characterized by infiltration of the lymphoma limited to the tumor margins and the uninvolved mucosa is normal. The third category, non-EATCL, is similar to EATCL-LLWE, except the lymphoma is limited to the ulcerated tumor.[4]

No malignant cells in primary T-cell lymphoma of the intestine were found to be large cell, anaplastic type.[4] However, large cell tumors with complex nuclei have been reported.[4,7] According to the Kiel classification, 21 of the 27 cases in Chott's series were large cell lymphomas (pleomorphic medium and large cell). The remaining 6 were of the small cell type.[4] Nearly all extra-nodal T-cell lymphomas of the intestine are CD3+, and many are CD8+.[4,13]

See Table 3. The association of celiac disease to malignant lymphoma was first recognized in 1937.[7] Since then, multiple studies have re-demonstrated this association between celiac disease and primary lymphoma of the intestine.[8,10] When EATCL complicates celiac disease, it generally does so in the fifth to the seventh decade of life, frequently, arising in the jejunum.[14] In celiac disease, the jejunal mucosa classically contains a high number of intra-epithelial T-cells and the villous atrophy seen may be related to T-cell mediated immunity.[7] Interestingly, primary T-cell lymphomas can occur with evidence of villous atrophy, with or without presence of celiac disease and malabsorption may be caused by diffuse infiltration of malignant cells.[4,11,15] The mechanism by which gluten-sensitive enteropathy progresses to a high grade T-cell lymphoma is thought to be reactive T-cells transforming into a low grade lymphoma and finally into a high grade lymphoma.[16,17] The sensitivity to gluten might increase the number of activated T-cells, and theoretically, one of these cells becomes clonally expanded into a lymphoma.[9] Other theories suggest that certain forms of celiac disease may actually be a low grade intra-epithelial T-cell lymphoma and not a reactive T-cell proliferation.[2,3,4] Certain cases of celiac disease are thought to be associated with specific HLA phenotypes.[11,14,17] In particular, susceptibility to celiac disease is thought to be related to the HLA-DQ heterodimer; these molecules are thought to be responsible for the binding and presentation of gliadin proteins to T-cells.[14] Perhaps primary T-cell lymphoma of the intestine is also associated with certain HLA phenotypes.

Several systems are available to stage extranodal, non-Hodgkin's lymphomas. The Ann Arbor method,

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created for Hodgkin's lymphomas, has been somewhat problematic.[2,5,10] Blackledge, et al outlined a system for staging of primary GI lymphomas.[18] This method was further modified at the Lugano workshop and is the suggested method for staging primary gastrointestinal lymphoma.[2,19] Stage I disease involves tumor limited to the GI tract (Ib represents multiple tumor sites). Stage II disease represents those tumors that have spread beyond the primary site, with local nodal involvement, including penetration into surrounding structures, perforation or peritonitis. Stage III disease includes distant and widespread nodal involvement. Stage IV disease includes those lymphomas with disseminated disease or supradiaphragmatic nodal involvement.[2,5,19]

The work-up for primary T-cell lymphoma of the intestine has not been clearly delineated. The examination of the upper gastrointestinal tract with a small bowel follow through is abnormal in up to 90% of patients with lymphoma of the small intestine; however, this test is rarely diagnostic.[10] Enteroclysis and small bowel enteroscopy with multiple biopsies may provide additional information. The lower gastrointestinal tract is best visualized by a colonoscopy or a barium enema. Computerized tomography of the abdomen and pelvis can help define the extent of tumor spread and lymph node involvement (i.e. stage) and allow the patient to be followed non-invasively.[10] However, as in our patient, all of these tests might be inconclusive and a laparotomy may be required to obtain adequate tissue for pathological analysis.

Treatment of primary T-cell lymphoma of the intestine involves a multidisciplinary approach. In a review by Liang, multivariate analysis failed to show that surgical resection was an independent prognostic factor.[5] However, surgery may help prevent perforation and hemorrhage which may account for 22%-78% of chemotherapy failures; though these risks may be overestimated and the role of surgery may diminish.[3,10,20] In those patients with EATCL arising in the face of celiac disease, a gluten free diet may slow the progression.[21] In those with celiac disease alone, a gluten-free diet may protect against the development of primary T-cell lymphoma altogether.[8,20] However, Holmes, et al demonstrated an increased risk of small bowel lymphoma in patients on a normal diet or a decreased gluten diet suggesting that the survival benefit is seen only in those patients adhering to a strict gluten free diet.[22]

The most important prognostic factor is the clinical stage of the lymphoma.[10] Primary T-cell lymphoma of the intestine is a rare entity however, and the survival data demonstrates that it is an aggressive tumor. In the series by Chott, 20 of 27 patients died. The average survival was 4 months.[4] Grogan, et al reported a median survival time of one year in a series of eight patients treated with m-BACOD (methotrexate, bleomycin, doxorubicin, cyclophosphamide, vincristine, and dexamethasone).[2]

The case that was presented represents what we believe to be the first documented case of enteropathy associated T-cell lymphoma presenting as anasarca. Enteropathy associated T-cell lymphoma of the small intestine is an exceedingly rare lymphoma with approximately 100 cases reported in the literature. Our patient is alive 18 months after initial diagnosis, however, he has begun to lose weight and it is thought that he may have recurrence of the disease.

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Dietary Fiber and Coronary Artery Disease

William W. Chu, MD, PhD; and Peter G. Hanson, MD

ABSTRACT

Ischemic coronary disease remains the leading cause of death in the United States, and exerts a tremendous cost burden to the health care system. Hypercholesterolemia has been shown to be one of the major risk factors of artherosclerosis, which plays an important role in the pathogenesis of coronary artery disease (CAD). Over the past 3 decades, a variety of epidemiological, animal studies and human (clinical) trials have demonstrated the preventive and therapeutic benefits of dietary fibers on hypercholesterolemia and the reduction of mortality rate from CAD. To review the data, hopefully this article can draw more public attention to dietary fibers given their beneficial effects and relatively low side-effect profile. Diet modification should be the initial approach to the clinical management of hypercholesterolemia.

INTRODUCTION

In the United States, myocardial infarction (MI) accounts for 1 of every 3 deaths, or nearly 600,000 deaths each year. A therapy that improves survival by even 20% would affect tens of thousands of lives.[1] In 1982, Multiple Risk Factor Intervention Trial (MRFIT) demonstrated that the relative risk (RR) of mortality from CAD in men increased four-fold between the lowest serum cholesterol levels of <167 mg/dl and the highest of >264 mg/d1.[2] It has been shown that every 1% reduction in serum cholesterol could reduce heart disease mortality by 2%.[3] On a population-wide basis, each 5% reduction in LDL would reduce the number of persons for whom pharmacological therapy is indicated by 5 million to 7 million. The third National Health and Nutrition Examination Survey suggested that 29% of all Unitd States adults are candidates for lipid-lowering dietary therapy and 7% are candidates for lipid-lowering drug therapy. More than 15 million Americans have abnormal lipid levels, and 40 million to 50 million have undesirable levels.[4] Currently, the United States remains one of the lowest dietary fiber intake countries in the world.

The classic approach to cholesterol management has been to employ a two-stage treatment. In the first stage, non-pharmacological methods, such as Step II low-fat diet, exercise, weight loss and alteration of environmental factors are employed. The second stage is obviously medications. A low fat/cholesterol diet was recommended by National Cholesterol Education Program (NCEP).[5] In January 1997, FDA reviewed over 37 studies demonstrating that oat-bran can lower serum cholesterol, and made the first health claim for a specific food, "Soluble fiber from oatmeal, as part of a low saturated fat, low cholesterol diet, may reduce the risk of heart disease."[6]

Hippocrates (400 BC) once said, "Whoever gives these things (foods) no consideration and is ignorant of them, how can he understand the diseases of man?" Based on the beneficial effects of dietary fibers on hypercholesterolemia, they can be certainly used as the bridge between diet control and medications.

DIETARY FIBERS

In the 1800s, fiber was already a household name, although it was not actually called fiber. Most people referred to it as roughage and realized it played an important role in health. Dietary fibers have multiple effects including reduction in risk of breast, colon and prostate cancer; prevention of constipation; prevention of diverticulosis; reduction of hypertension; and improvement of glucose metabolism. In addition, they have been found to have hypocholesterolemic effects in the past 30 years, from epidemiological studies to animal studies, and then human (clinical) trials.[7] Dietary fibers in general refer to the complex carbohydrates in fruits, vegetables, grains, nuts and legumes that can not be broken down by human digestive enzymes.[7]

Dietary fibers can be classified into two categories, soluble and insoluble fibers. Soluble dietary fibers include pectins, gums, psyllium (mucilages) and algal polysaccharides, while insoluble fibers include cellulose, lignin and hemicellulose. The current popular

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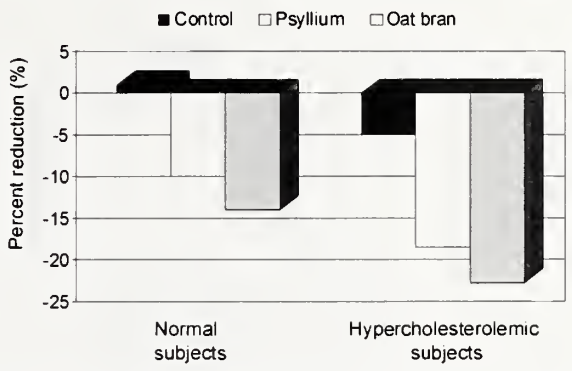
fiber supplements are psyllium and methylcellulose. BIOS LIFE 2 is one of the new fiber products and seems superior to other fiber supplements because it contains a mixture of different kinds of dietary fibers such as guar gums, locust bean gum, pectin, oat fiber, gum acacia, barley and stevia.[8] The current guideline recommends a total daily fiber intake of at least 20-30 g with 25% of the fiber being soluble fibers.

Dietary fibers are generally well tolerated and have a relatively low side-effect profile. The common side effects include flatulence, cramping, bloating, loose stools, diarrhea, and possible mineral deficiency, especially calcium. Dietary modification is often prematurely discontinued in favor of drug therapy. Such a change might be attributable to the patients' poor perception of and compliance with the dietary regimen, the physicians' lack of confidence, or impatience by both doctors and patients.

Figure 1. Percent changes between baseline and 8 weeks in total cholesterol of normal subjects (cholesterol<200 mg/dl) or hypercholesterolemic subjects (cholesterol>220 mg/dl) fed control, psyllium or oat bran cookies.



HYPOCHOLESTEROLIMIC EFFECTS

Proposed mechanisms by which soluble fibers lower cholesterol are still not fully understood, and remain under intense study. Multiple mechanisms may interact to produce the cholesterol-lowering effects, and each fiber may work through various effectors differently. Available data support the following four proposed mechanisms.

First, most soluble fibers increase fecal excretion of bile acids and alter the percentages of various primary and secondary bile acids excreted by the liver. As food is digested, the bile acids are reabsorbed into the body. However, soluble fibers bind bile acids in the small intestine and thereby block their reabsorptions. Decreased absorption of bile acids leads to switching of cholesterol to synthesis of bile acids, resulting in less cholesterol is available for synthesis of lipoproteins. This reduction in cholesterol synthesis further leads to an up-regulation of the LDL receptor and, in turn, to an enhanced uptake of LDL from the plasma.[9,10] Animal studies in hamsters showed psyllium increased hepatic 7α-hydroxylase activity and mRNA levels by 3-4 fold. Hepatic 7α-hydroxylase is the initial and rate-limiting enzyme in the bile acid biosynthesis pathway, and the activation of 7α-hydroxylase was associated with an increase in hepatic bile acid synthesis.[11] Similar results were obtained in rats by pectin.[12]

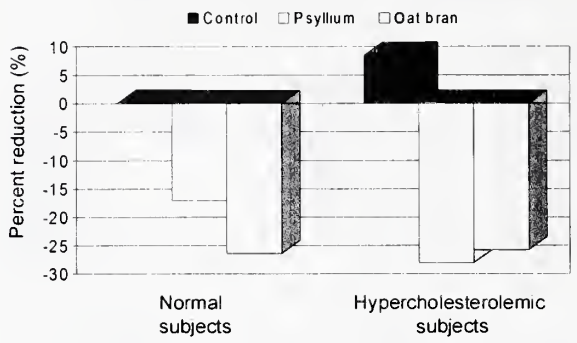
Second, most soluble fibers decrease the absorption of lipids and cholesterol leading to change in the size and composition of serum lipoproteins by alteration of gastric function; decreased availability of bile acids, interference with effective micelle formation, alteration of digestive enzyme availability or activity, changes in intestinal motility and mixing of intestinal contents, alterations in the unstirred water layer or other physiological changes in the absorptive surface, changes in the morphology and function of intestinal absorptive cells, and changes in flow through capillaries or lymphatics.[9]

Third, most soluble fibers are fermented in the colon to yield short-chain fatty acids which are carried to the liver and may affect cholesterol and lipoprotein metabolism. Water soluble fibers, unlike insoluble components, are fermented almost completely by colonic bacteria to short chain fatty acids (SCFA), acetate, propionate and butyrate. These SCFA's have been shown to suppress cholesterol synthesis by limiting the action of HMG-CoA reductase or by increasing the catabolism of LDL.[9]

Last, soluble fibers tend to decrease serum insulin concentration and increase peripheral insulin sensitivity while altering other pancreatic and GI hormone levels. Insulin is a key regulatory hormone both for lipid synthesis in many body tissues and lipid mobilization from adipose tissue and liver. Dietary fibers can markedly alter insulin responses by modifying glucose absorption, thereby lowering cholesterol levels.[9]

As mentioned above, numerous studies have shown that dietary fibers can reduce total and LDL cholesterol levels. However, some of these studies can be criticized for their lack of a randomized, low-fat control group. Without such, it is possible that serum cholesterol reduction occurs not because of any specific cholesterol-lowering effects of soluble fiber, but rather because the introduction of fiber-rich foods replaces foods rich in saturated fatty acids and cholesterol. To answer this question, Jenkins and colleagues[13] performed a crossover study of 43 volunteers (15 men and 28 women, aged 29-70 years), who were randomly assigned to two 4-month dietary periods (soluble fiber, n=22; insoluble fiber, n=21) preceded by a 2-month NCEP Step II low-fat diet. When the soluble-fiber

Figure 2. Percent changes between baseline and 8 weeks in LDL cholesterol of normal subjects (cholesterol<200 mg/dl) or hypercholesterolemic subjects (cholesterol>220 mg/dl) fed control, psyllium or oat bran cookies.



period was compared with the insoluble-fiber period, the subjects' total cholesterol and LDL were reduced by 4.9+0.9% ($p<0.001$) and 4.8+1.3% ($p<0.001$), respectively. Therefore, even after dietary saturated fat and cholesterol have been reduced, a further reduction can be achieved from the soluble fiber.

In 1993, Sprecher and coworkers[14] published a double-blinded, placebo-controlled, 16-week parallel trial (8-week baseline period and 8-week treatment period). Healthy men and women, aged 21-70 years, with primary hypercholesterolemia (>220 mg/dl) were included. Thirty-seven followed a high-fat diet, 81 followed a low-fat diet, and then they were randomly assigned to either psyllium (Metamucil, 5.1 g BID), or placebo. Psyllium (Metamucil) produced a modest but significant cholesterol-lowering effect in persons on either low-fat or high-fat diet. High-fat diet, lowered total cholesterol 5.8%, LDL 7.2% ($p<0.05$), while low-fat diet lowered total cholesterol 4.2%, LDL 6.4% ($p<0.05$). No significant changes in HDL between any groups compared were identified.

More recently, a randomized, placebo-controlled, 8-week study was performed to study a particular target population, the sedentary normal (cholesterol<200 mg/dl, n=36) and hypercholesterolemic (cholesterol>220 mg/dl, n=30) men from Northern Mexico aged 20 to 45 years. The subjects were randomly allocated to three groups, with a control group consuming cookies with wheat bran and two treatment groups consuming either psyllium, or oat bran. The hypocholesterolemic effects of psyllium are demonstrated in Figures 1 and 2 ($p<0.001$). No effects on HDL or triglycerides levels except for hypercholesterolemic individuals supplemented with oat bran where a 28% reduction in triglycerides was observed after 8 weeks ($p<0.001$). LDL/HDL ratio, a reliable predictor for CAD was significantly improved with psyllium or oat bran supplementation ($p<0.001$).[15]

To answer the question of whether the hypocholesterolemic effects can be prolonged, a randomized, double-blinded, placebo-controlled, long-term (24 weeks) study was performed. Two hundred eighty six men and women, aged 21 to 80 years, who had LDL cholesterol between 130 and 220 were randomly assigned to one of four treatment groups (0, 3.4, 6.8 or 10.2 g psyllium) after following a low-fat diet for 8 weeks. At week 24, LDL cholesterol was 3% above baseline in the control group, while in the group consuming 10.2 g psyllium, LDL remained 5.3% below that of the control group ($p<0.05$). The changes in total cholesterol paralleled those of LDL. And again, no significant effects were found on HDL or triglyceride levels.[16] Moreover, another randomized, double-blinded, placebo-controlled, long-term (6 months) study was published recently. Fifty-one healthy subjects, aged 25 to 65 years, were stabilized on NCEP Step I diet. They were randomly assigned into a treatment group (15 g/d water-soluble fiber including a mixture of psyllium, pectin, guar-gum and locust bean gum) and control group (acacia gum). After 8 weeks, the water-soluble fiber diet yielded 6.4% and 10.5% reduction in total and LDL cholesterol respectively, which were sustained at 16 and 24 weeks. Not surprisingly, HDL and triglycerides were unchanged in this study. The maximum cholesterol lowering effects of the water-soluble fiber diet were similar for men and women.[17] Furthermore, Anderson and colleagues[18] designed an even longer study to address the same question. Their study was a prospective, randomized, placebo-controlled study to compare the cholesterol-lowering effects between low-fat and low-fat plus high-fiber diets (3 g soluble fiber compared with 1.5 g in low-fat diet). One hundred forty-six Caucasian men and women, moderately hypercholesterolemic, aged 30 to 50 years, were randomly assigned to different treatment groups and followed for 12 months. The high-fiber group had a greater reduction (13%) in cholesterol than did the low-fat (9%) and control group (7%). After adjustment for relevant covariates, the reduction in the high-fiber group was significantly greater than the low-fat group ($p<0.05$), but not between the control and the low-fat groups. The significant reductions experienced by the control group may be explained by the motivation of these volunteers to significantly lower the fat content in their diet, but not increase in fiber consumption by dietary records.

REDUCTION OF CAD RISK

The preceding discussion clearly indicates that dietary fibers supplementation can reduce serum cholesterol, and hypercholesterolemia is a major risk factor of CAD. However, it is more important to show that

dietary fibers can independently reduce the incidence of MI. In 1996, Pietinen and coworkers[19] published a large cohort study to address this issue. This study was a substudy of the α-Tocopherol, β-Carotene Cancer Prevention (ATBC) study (a randomized, double-blinded, placebo-controlled trial to determine whether daily supplement of α-tocopherol or β-carotene would reduce the incidence of lung cancer in male smokers). Included were 21,930 smoking Finnish men aged 50 to 69 years were included, and a validated dietary questionnaire at baseline was obtained and followed for 6.1 years. The end-point was non-fatal MI and CAD death. Compared with the highest quintile of total dietary fiber intake (34.8 g/d) and the lowest quintile (16.1 g/d), the risk ratio (RR) for CAD death was 0.69 ($p<0.001$). Both end-point entities had a significant inverse association with dietary fibers, but stronger for CAD death. Adjustment for known CAD risk factors, intake of saturated fat and vitamins, did not materially change the result. Water-soluble fiber was more strongly associated with reduced CAD death than insoluble fiber. Cereal fiber had a stronger association than vegetable or fruit fiber. Interestingly, no reduction in lung cancer after 5-8 years follow-up was elucidated.

Another large cohort study recruited 43,757 United States male health professionals who were aged 40 to 75 years to examine prospectively the relationship between dietary fiber and the risk of CAD. The end-point was fatal and non-fatal MI after 6-year follow-up. The age-adjusted RR for total MI was 0.59 (95% confidence interval [CI], 0.46 to 0.76) in the highest quintile of total dietary fiber intake (median, 28.9 g/d) compared with the lowest quintile (median, 12.4 g/d). The inverse association was the strongest for fatal CAD (RR=0.45, 95% CI, 0.28 to 0.72). After controlling for smoking, physical activity, other CAD risk factors, dietary saturated fat, Vit.E, total energy intake, and alcohol intake, RRs were only modestly attenuated. Again, cereal fiber was most strongly associated with a reduced risk of total MI (RR=0.71, 95% CI, 0.55 to 0.91) compared with vegetables or fruits.[20]

Very recently, an even larger cohort study was finished. Nurses' Health Study is a prospective study of 68,782 U.S. women, aged 37 to 64 years, who were followed for 10 years from 1984. The end point was the incidence of non-fatal MI or fatal CAD. The age-adjusted RR for major CAD events was 0.53 (95% CI, 0.40 to 0.69) in the highest quintile of total dietary fiber intake (median 22.9 g/d) compared with the lowest quintile (median, 11.5 g/d). After controlling for age, CAD risk factors, dietary factors, and MVI use, the RR was 0.77 (95% CI, 0.57 to 1.04). Cereal fiber was most strongly associated with a reduced risk of CAD with multivariate RR of 0.63 (95% CI, 0.49 to 0.81) for each 5 g/d increase in cereal fiber. The inverse associations of CAD with cereal fiber were seen in all groups, but strongest in never or past smokers, leaner women, women younger than 60 years, those in the lowest tertile of saturated fat intake, and those in the highest tertile of trans fat intake.[21]

Figure 3. Percentage of reduction in total, LDL cholesterol and LDL/HDL ratio. D represents low-fat and soluble fiber diet; DC represents the above diet plus cholestyramine. All p values were less than 0.001.

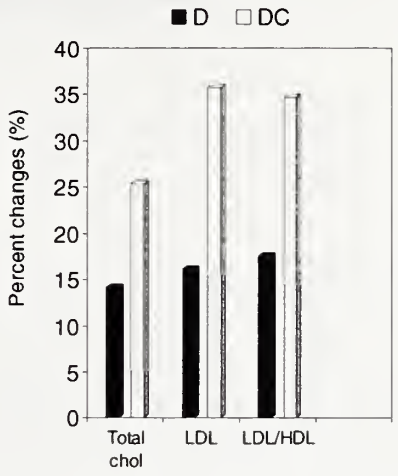
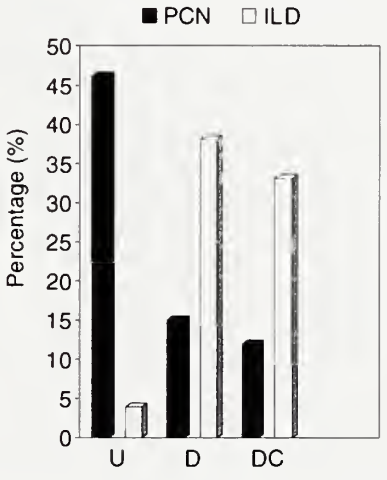


Figure 4. Percent changes in PCN (progression of coronary narrowing) and ILD (increase in luminal diameter) among group U (usual care, control), D (low-fat and soluble fiber diet), and DC (the above diet plus cholestyramine).



Most interestingly, Watts and colleagues[22] successfully demonstrated anatomical evidence of beneficial effects from the dietary fibers in the St. Thomas' Atherosclerosis Regression Study (STARS). This study was a randomized, placebo-controlled, end-point-blinded trial based on quantitative image analysis

of coronary angiograms in patients with angina or past MI. Seventy-four men less than 66 years of age with CAD were randomized to receive usual care (U), dietary intervention (D, low fat and 3.6 g pectin/1000 Kcal), or diet plus cholestyramine (DC, 8 g BID) with angiography at baseline and at 39 months. The principle end-point was the change in the mean absolute width of the coronary segments (MAWS), and the clinical end-point was deaths, nonfatal MI, CABG or PTCA, stroke, angina, or change in anti-anginal medications. The authors were able to show that dietary fibers could reduce serum total and LDL cholesterol levels (Figure 3), and the change in MAWS was independently and significantly correlated with LDL and LDL/HDL ratio. Dietary change alone retarded overall progression and increased overall regression of coronary artery disease, and diet plus cholestyramine was additionally associated with a net increase in coronary lumen diameter (Figure 4).

CONCLUSIONS

Hippocrates (400 BC) also said, "Let food be your medicine and medicine be your food." It is very important that we take advantage of the wisdom in the past and integrate it into our current practices. This article has reviewed studies showing that soluble fibers have important hypocholesterolemic effects. Serum total and LDL cholesterol decreases 5% to 20% with increased ingestion of soluble fibers. However, they do not have significant effects on HDL or triglycerides. Diet modification should be the initial approach to the clinical management of hypercholesterolemia, and the use of fiber supplements is the next logical step in a treatment program. More importantly, dietary fibers can independently reduce the CAD mortality rate.

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Randomized Trial of Oral Hydrocortisone and its Effect on Emergency Physicians During Night Duty

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ABSTRACT

Study Objective: To analyze the effects of hydrocortisone (40 mg. po) administered to emergency physicians on their first night shift following a series of day shifts.

Design: Prospective, double-blinded internal crossover study on objective and subjective parameters. Each participant was studied for a minimum of 10 nights.

Type of participants: Four healthy male emergency physicians in their mid to late thirties.

Interventions: After baseline endocrine assessment, the subjects ingested a capsule containing either 40 mg of hydrocortisone or placebo (lactose) at the start of a first nightshift (starting at 10 pm or 11 pm) after day duty. Subjects self-administered psychological testing one hour after taking an oral capsule by listening to a self-guided audio tape (between 11 and 12 p.m), and again between 4 and 5 am. Blood samples were obtained during the first 4 nights of each subject at 11 pm, 2, 5 and 8 am.

Measurements and main results: Four emergency physicians entered 42 nights of data. No differences in testing were detected. Plasma cortisol levels were measured and demonstrated cortisol levels consistent with oral replacement therapy. Physicians could subjectively differentiate the difference between hydrocortisone treatment and placebo: of 21 hydrocortisone nights, 17 were identified as "a good night" in reference to fatigue. Of 21 nights without hydrocortisone, 15 were identified as "bad" nights, ($p < .001$).

Conclusion: Hydrocortisone, administered before a nightshift to day-accommodated workers, recreated the rise of plasma cortisol seen on awakening and was shown to be an effective means of decreasing subjective fatigue of a first nightshift.

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INTRODUCTION

The need to be alert and competent on night duty in a profession that requires episodic night shifts is a major issue among emergency physicians, as with many professions in the modern industrial age.[1] Emergency physicians report substantial career dissatisfaction because of the burden of dealing with night shifts and the accompanying sleep disturbances.[2] Administration of hydrocortisone has not been used to decrease the perception of stress and improve mood during night shifts whereas melatonin has been evaluated as an endocrine intervention with variable findings.[3,4,5] This study determined whether hydrocortisone, administered in a fashion to mimic peak physiological concentrations of cortisol, could improve the perception of fatigue.

This study also addressed the ability of episodic night workers (emergency physicians) to perform complex tasks as measured by standard tests. The literature demonstrates greater accident rates on night shifts.[6] Physicians could be prone to that same tendency to error. The need to be alert, awake and competent, regardless of work shift is important to the customer of the night worker, just as the fatigue of the job is important to the worker.

The intent of this study was to mimic normal awakening (8 am) plasma cortisol levels at the start of a night shift. Psychological testing, subjective fatigue measures, and plasma ACTH and cortisol concentration were assessed. Our hypothesis was that this intervention would decrease subjective fatigue, improve objective physiologic testing, and recreate a daytime endocrine profile of cortisol levels.

MATERIALS AND METHODS

This was designed as a prospective, double-blind, placebo-controlled, crossover trial of hydrocortisone given to practicing emergency physicians at the beginning of an episodic "first night" shift.

Table 1. Physician Perception of Fatigue of Night Shift With and Without Cortisol

Question: Did you have a good night?	Hydrocortisone Given (n=21)	Placebo (n=21)
Number Yes	17	6
Number No	4	15
Percent Yes	81%	29%
95% Confidence Interval	(63%–99%)	(8%–40%)
	$p < .001$	

Subjects and Setting: Four male emergency physicians, ages 35-38, were recruited. Each subject was free of medical or psychiatric disorders including high blood pressure, diabetes, peptic ulcer disease or any medical illness requiring therapy. All were practicing actively on a full time basis, working 2-6 night shifts (8-10 hours each) a month with 30-40 hours a week of clinical time. All worked in busy urban emergency departments with more 30,000 patients a year. All study night shifts were isolated from previous night shifts by at least 10 days to allow for day entrainment. The study protocol was reviewed and approved by the Institutional Research Board. Informed consent was obtained.

Only "first nights" qualified as research nights. To be a first night necessitated 10 full days of prior day or evening work. Most patterns of night work involved 2-4 consecutive nights and then no night duty for several weeks. No restrictions were placed on activities or sleep prior to work.

The protocol for study nights was designed to avoid interruption of patient care. If the physician could not take the time off from patient care (10-12 minutes) to administer the testing protocols, the night was canceled as a study night.

Procedures: Pretesting included a standard cosyntropin stimulation test (.25 mg. of Cortrosyn, Organon) was injected IV between 8-10 am, with plasma samples for ACTH and cortisol collected before and 30 minutes after injection. This was performed to insure that all participants had a normal adrenal axis, and could then be compared to a post study test to insure no adverse effect of drug treatment. All participants also had a prestudy session in which they performed the standardized psychological tests chosen to assess mental alertness and competence.[7] These included the 60-second Peg Board[7] dexterity test, the Paced Auditory Serial Addition Test (PASAT)[7], the 60 second Digit Symbol Recognition[7] test and a Profile of Mood States.[8]

A recorded audio tape was played that allowed for self-testing in a standardized time frame. The Peg Board Test has the subject use their dominant hand to place pegs from a basin to a board. The PASAT has numbers read in sequence between 1 and 10 with the subject required to add and write down the sum of the previous two numbers. The Digit Symbol Recognition test requires a standard set of symbols to be matched with numbers. These three were timed and assessed for accuracy. The Profile of Mood States scale was designed to address fatigue and stress. It was completed last without time constraints.

The psychological tests were performed in response to an eight minute recorded tape with instructions and timed intervals on the tape. All subjects had identical times (11 pm and 4-5 am,) for each test and could administer their own testing with a witness to verify compliance.

A diary was designed to detail the subjective and objective features of the duty period. Subjects recorded time since last night shift, subjective amount of sleep obtained prior to coming to work, subjective quality of sleep prior to work, number of patients seen during the shift, amount of caffeine consumed, amount of food eaten, subjective stress symptoms experienced during the shift (headache, GI upset, cold shivers, etc.), and a judgment as to the quality of the shift in regards to stress and fatigue. (i.e. "Was it a good night?")

Physicians were instructed to consume a gelatin capsule between 10 and 11 p.m. and record the time. It contained either lactose as placebo or 40 mg of hydrocortisone. All capsules were prepared by the hospital pharmacy and coded to insure that only the pharmacist knew the content of the capsule. Each physician was given 5 nights of lactose and 5 nights of hydrocortisone in double-blinded randomized order. The physicians picked their own capsule from their assigned stock of envelopes and recorded the number on their diary. Extra nights were scheduled because of the need to cancel nights for busy shifts.

At approximately 1 hour and again at 5-6 hours after consumption of the study capsule, the physicians were instructed to take the battery of neuropsychological tests and to have their blood drawn. Emphasis was placed on patient care as the principle priority while on duty with performance of the study protocol dependent on time availability. A nurse on the night duty shift witnessed compliance with the time standards on the tape.

Plasma ACTH was measured by immunoradiometric assay.[9] Plasma cortisol was measured by radioimmunoassay (Diagnostic Products.)

Statistical Methods: Plasma cortisol and ACTH level were compared by use of analysis of variance, with the

11 p.m. to 5 a.m. treated as a repeated measure. Categorical data was tested for significance by use of the chi-square test. Data was analyzed using the SAS system.

RESULTS

Complete data was collected during forty-two nights. Five nights were not included because physicians were too busy with patient care to complete the second battery of tests. Two were cortisol nights and three were placebo nights. Three potential study nights were not used for a variety of other reasons.

Subjective Data: A subjective assessment of fatigue during the night showed that the physicians felt less fatigue on nights when they took hydrocortisone ($p < .001$) (Table 1). Of twenty-one (21) nights on which hydrocortisone was administered, seventeen (17) were identified as being "Good nights." Fifteen (15) of twenty-one (21) nights in which placebo was administered were considered "Bad."

Objective Psychological Data: None of the objective psychological tests showed significant effects of hydrocortisone. The PASAT had a mean score of 51.3 at 11 p.m. to 51.7 at 5 am on placebo (of a possible 60). On hydrocortisone, it was 53.3 at 11 p.m. to 52.9 at 5 a.m. (p=NS) The Digit Symbol Recognition and Pegboard tests also showed no significant change for nights in which hydrocortisone was used.

Mood analysis was used to create a "Distress Scale" which contained a summary score that combined answers to the questions regarding tension, depression, anger, vigor and fatigue. Its summary showed that from 11 p.m. to 5 a.m. the peak of fatigue increased and vigor and clear-headedness decreased from 11 p.m. to 5 a.m.

No effect could be attributable to hydrocortisone use on any of the neuropsychiatric tasks ($p > .50$ for the PASAT and Digit Symbol: $p > .10$ for pegboard). On the other hand, 11 p.m. performance was found to be a significant determinant of 5 a.m. performance regardless of drug use ($p = .001$)

Figure I shows plasma cortisol measured at 11 p.m., 2 a.m., 5 a.m. and 8 a.m. after the oral dose of hydrocortisone was given at 10 p.m. Plasma cortisol levels were maximum shortly after the oral dose and then declined over 9 hours.

Endocrine testing (Table 2 and Figure 1) demonstrated that a peak of plasma cortisol occurred one hour after oral administration of 40 mg of hydrocortisone, and subsequently trailed off over the following 5 hours. Plasma ACTH level at 5 am was lower in patients treated with hydrocortisone as compared to placebo.

Cosyntropin stimulation tests were normal and not different before and after completion of the study.

Physicians indicated more adverse subjective symptoms on night shifts without cortisol versus night shifts with cortisol. With such a small number of participants, significance could not be ascertained. A total of 8 comments were registered for adverse symptoms such as headache, GI distress, and feeling cold on placebo nights verses 5 such symptoms on cortisol nights.

DISCUSSION

This study demonstrated that the subjective sense of fatigue felt by night workers can be reduced by the administration of hydrocortisone. Objective testing was not measurably different on standardized tests.

To date, no studies exist in which hydrocortisone has been used as a means of assisting in the "phase shift." There are many descriptive studies on the circadian rhythms of shift workers, airline stewardesses and others exposed to alterations in the normal human day-night cycle, either shift or meridian change suggesting that there is a good deal of fatigue and stress involved.

The fatigue of night duty has been clearly documented in the medical literature. Approximately 7.3 million American workers have night duty as part of their job[10] and rarely make a complete adaptation to night duty and day sleep.[11,12,13] As an expected consequence, work related accidents are far more frequent on the night shift.[14,15] The U. S. Dept. of Transportation reports that up to 200,000 traffic accidents each year may be sleep related and that 20% of all drivers have dozed off at least once while behind the wheel.[16] Though causes of major industrial accidents are always complex, it should be noted that Three Mile Island, Bhopal, Exxon Valdez and Chernobyl all occurred on the night shift. These events only raise the importance of addressing the issue of human adaptation to night duty as society emerges from a diurnal work place to the 24-hour industrial age.

Czeisler and Johnson reported on a physiologic method of adapting to night work,[17] though their method required at least 4 days before physiologic adaptation occurred. They used bright lights during the night and complete dark during the day. This demonstrated that it takes time to adapt even with an efficient and carefully orchestrated protocol. This study did not address the need of managing the episodic single night which is the reality for many industrial age workers.

Moore-Ede and Schmelzer demonstrated in squirrel monkeys that cortisol mediates the synchronization of circadian rhythms.[18] Czeisler has shown that cortisol levels are at their nadir during the night hours, that cognitive performance and alertness decline during the progression of night hours to a nadir at 4-8 hours after midnight.

The effects of poor performance are not just transient. Moore-Ede has proposed the concept of a "shift maladaption" syndrome to describe the clinical pathol-

Table 2. Plasma Levels of Cortisol and ACTH at 11p.m. and 5a.m.

	Cortisol in µg/dl		ACTH in pg/ml	
	11p.m	5a.m.	11p.m.	5a.m.
Placebo night	4.9±0.9 N=4	12.1±1.7 N=4	21±2 N=4	38±6* N=4
Hydrocortisone night	35.0±5.6‡ N=4	8.9±0.8* N=4	16±4 N=3**	11±2‡ N=4

‡ Hydrocortisone ? placebo ($p < 0.05$)
*5a.m. 11p.m. ($p < 0.05$)
**Missing one data point, serum sample lost
Data analyzed by two way ANOVA (cortisol repeated on two factors; ACTH repeated on no factors to allow analysis of missing data points)
Data presented as mean ± standard error.

ogies observed in long time shift workers.[19] The consequences of repeated shift work over years have been poorly documented but include sleep-wake disorders, gastrointestinal pathology, and an increased risk of cardiovascular disorders.[20] Moore-Ede notes the extraordinary difficulty in studying night workers as they tend to be young, with few medical problems by merit of age. They tend to shift to day jobs as they gain seniority which invalidates longitudinal studies. Moore-Ede notes that the problems of jet leg, the physiological equivalent of shift work, are short term.[19]

The ability of humans to adapt to a shift in circadian systems is limited. It can only be reset by a few hours a day and therefore has a limited "range of entrainment."[21] The typical range of entrainment is approximately 23.5 to 26.5 hours for the synchronized human system, allowing a "phase advance" of .5 hours per day or a "phase delay" of 2.5 hours per day.[14]

To date no good research exists as to the "average career length" of emergency physicians. Experts in the field suggest lengths of 9-12 years prior to "burnout" and movement into other fields of medicine.[20,22] The need for Emergency Physician to remain alert and functionally competent is self-evident.[23,24] The correlation between the stress of nights and the longevity of career is also obvious.[25]

This study is the first in the literature to intervene on night shifts with a "missing ingredient." Cortisol is a hormone responsible for supporting diurnal metabolic cycles. The first night shift of a day-entrained person is relatively cortisol deficient. It could be argued that supplying the missing cortisol by administering hydrocortisone is an important adjunct for the night shift worker on a first night after day entrainment. This has not yet been explored by any study and remains conjecture.

Although this study did not address the mechanisms by which hydrocortisone replacement might improve function, there are several possibilities. The first is that administration of hydrocortisone at its normal circadian nadir might increase glucose and other substrate supply thereby minimizing fatigue.[26] Another more likely possibility is that increasing plasma cortisol improves mood and perception of function by a direct action on the brain and, in particular, the limbic system.[27]

The objective performance data indicated that there was no difference on neuro-psychological testing between cortisol nights and placebo nights. This corroborated the literature on surgery residents done in the late 1980.[7] It is the routine and the mundane that are markedly difficult to maintain. Testing by itself is a challenge that forces alertness, making measurements of alertness difficult.

The physiologic parameters demonstrate that an oral dose of 40 mg of hydrocortisone given at 10 p.m. does replicate the circadian rise and fall of cortisol, though at a slightly higher serum level than might occur with normal physiologic replacements. A morning rise in endogenous cortisol did occur on nights during which hydrocortisone was administered, suggesting that even this dose was not sufficient to provide suppression. Adrenal suppression did not occur on the cosyntropin follow-up testing in an intervention that occurred on average once a month.

The most intriguing finding of this study is the subjective data. The physicians were able to discern that nights with drug were "good" nights to a high degree of significance. The first question any emergency physician asks another when relieving them after a night shift is, "How was it?" The question has more to do with coping with the physiological stress than the work load.

What are the risks of long term hydrocortisone use? This study used only one treatment of hydrocortisone

on single first nights and no physician took hydrocortisone more frequently than once a month. The long term effects of hydrocortisone treatment would not be seen in single episodic treatments such as this. Readers attempting to use cortisol to effect decreased fatigue on night shifts must be cautioned that the lack of suppression on cosyntropin testing or adrenal suppression in this study may not be reproduced if cortisol were to be used more frequently than utilized in this study, which was approximately once a month.

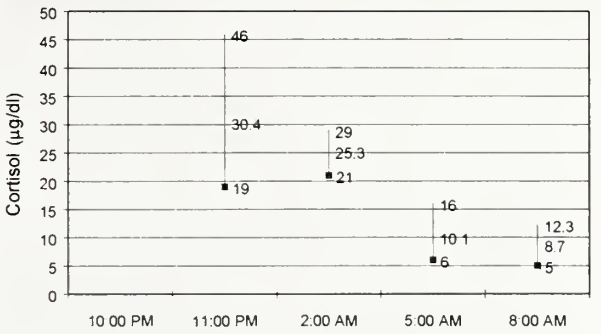
Studies of this nature have certain inherent difficulties that will need to be overcome if future studies of a similar nature are to be done on a larger scale. Sleep ahead of time before shift work was not controlled in this project. Most physicians reported napping an hour or two prior to a first night shift - but reported having trouble doing so because they were still day entrained. Shift length was approximately the same but many EDs have12 and 14-hour night shifts.

This study is certainly inadequate in numbers to suggest that the use of hydrocortisone resolves the problems of night shift workers. Subjective improvement was sufficiently positive as to offer a glimmer of hope to a previously unexplored strategy. The study does have some weaknesses that a repeat study would need to address. Length of sleep prior to the study was not controlled. Work load during the shifts were not controlled though no physician reported sleep on any shift. Caffeine consumption was not controlled or recorded. All of these could have some confounding impact on the results.

That possibility may involve a variety of interventions to assist those in the transition zone of time period entrainment. The use of a vital hormone to replace a physiologic deficit may not apply only to night shift workers working a first night, but also to international travelers shifting multiple time zones.

Hydrocortisone, administered to night shift physicians on their first night after day entrainment, is an effective means of decreasing subjective symptoms of fatigue and stress. It is not clear whether it is possible to improve objective performance parameters by such an intervention.

Figure 1. Plasma levels of cortisol in male subjects after 40 mg oral dose at 10 p.m. (µg/dl) performed while daylight entrained (at least 6 days since working a night shift



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Breast Imaging Trends in Wisconsin

Pamela A. Propeck, MD; and Kathleen A. Scanlan, MD

PURPOSE

This survey was performed to determine what breast imaging services are being offered in Wisconsin and compare this information to a similar survey performed in 1997 looking for any developing trends.[1]

Methods: A survey of participants at the University of Wisconsin Mammography Update Continuing Education Conference of 1999 was performed. Of the 135 questionnaires distributed, 68 were returned fully completed and 2 partially completed.

Results: The majority of sites were located in Wisconsin with 59 diagnostic facilities and 57 screening facilities surveyed (some participants were involved with more than one facility). Overall there has been a marked increase in the number of sites having some type of women's imaging center and there has been an increase in the volume and type of breast interventions performed by medical imagers.

Conclusion: Breast imaging and breast interventions are increasing rapidly with increased involvement of the medical imager in the diagnosis and management of breast disease.

INTRODUCTION

Mammography remains a vital component in the early detection of breast cancer. Recent reports regarding the efficacy of screening mammography in the 40-50 year old population has led to the endorsement of screening mammography for women over age 40 by the American Medical Association, American Cancer Society, American College of Surgeons, and American College of Radiology. The goal of screening mammography is to detect breast cancer in the absence of any signs or symptoms. The goal of diagnostic mammography is to evaluate patients with signs or symptoms of breast abnormalities.[2] The number of women participating in mammographic screening has increased dramatically and the radiologic community is striving to keep up with the patients' needs as well as with increasing regulatory demands.

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METHODS

The University of Wisconsin Mammography Department holds a biennial two day Continuing Medical Education Mammography Update course with both national and local speakers who address issues pertinent to breast health. A questionnaire regarding specifics of breast imaging was given to each participant. Of the 135 questionnaires distributed to course participants, 68 were returned fully completed and 2 partially completed. There were 23 items on the survey. All respondents received a copy of the tallied results.

RESULTS

Composition of Sites Surveyed: 116 mammography sites were surveyed with 59 performing diagnostic exams and 57 performing screening. The largest change was the increase of women's imaging centers 30/116 (26%) increased from 11 % in 1997. The majority of screening sites, 58%, had more than one machine at their facility.

Coordinated Physical Exam of the Breast: Twenty percent of facilities offer this service which is similar to 1997 when 23% provided it. The majority of exams are performed by an allied health professional.

Prior Mammographic Studies: Seventy-five percent of facilities request prior mammographic studies before the patient arrives for her exam if they were performed at a different institution. Ninety-six percent of facilities attempt to retrieve these studies before issuing a final mammographic report.

Self-referred Patients: Sixty percent of facilities accept self-referred patients which has increased from 1997 when it was slightly over half.

Providing Mammography Results: On the present survey, 97% of facilities don't provide patients with their screening mammography results at the time of

their exam. This has increased from 1997 when 91% of facilities gave their screening patients the results at the time of their mammogram. Thirty-seven percent of facilities performing diagnostic exams do provide their diagnostic patients a report before they leave the department. This is an increase of 10% from 1997.

Breast Compression: The vast majority of facilities, 97%, will encourage the patient to tolerate the compression needed to perform the exam and won't terminate the exam if she is unable to tolerate the recommended amount of compression.

Breast Implants: The management of the breast implant patient is always raised when discussing compression as there have been anecdotal reports of implant ruptures.[3] Thirty-two percent of institutions have patients sign a consent form regarding possible but small risk of rupture of their implants from breast compression. This has increased from 10% in 1997.

Scheduling Mammographic Exams: Sixty-nine percent of diagnostic sites had a schedule backlog which prevents patients from walking in and having their exam immediately. Ninety-one percent of facilities were able to accommodate patient with a breast problem within 2 weeks of the request.

Screening facilities have more significant backlog problems. Forty-three percent of screening sites had backlogs of 3 weeks or greater from time of request for the exam. Only 4% of screening facilities could accommodate patients within 1-3 days of the request. This is a marked changed from the 1997 survey which demonstrated 20% of screening facilities could accommodate a patient within 1-3 days.

Definition of Screening versus Diagnostic Mammogram: Screening mammography is an x-ray examination to detect unsuspected breast cancer at an early stage in asymptomatic women. It usually consists of 2 views of each breast; a mediolateral oblique view and a craniocaudal view. Screening mammography is performed by a radiologic technologist and interpreted in batches.[2]

Diagnostic mammography also called problem-solving mammography, is an x-ray examination to evaluate abnormal physical findings in the breast, abnormal findings on a screening mammogram, or special cases such as breast implants. This exam is performed under the supervision of a qualified interpreting radiologist.[2]

Fifty-six percent of sites consider a patient who has undergone a mastectomy to be a diagnostic patient and 41% consider her as a screening patient. This has decreased from 1997 when 69% of sites considered a mastectomy patient to be a diagnostic patient.

Presence of Radiologist On-site During Additional Views: The Food and Drug Administration recommends that diagnostic mammography be performed under the direct supervision of a radiologist. If a radiologist isn't present at the time of exam, only 19% of facilities will work up abnormalities whereas 29% will not, and 38% vary their practice depending on the situation. Again this question was the most frequently left blank, 13% of respondents elected not to answer it.

Time Allotted for Completion of the Mammographic Exam: This hasn't varied significantly since the last survey for screening exams. Eighty percent of facilities use 30 minutes for screening. Eighty-five percent of facilities use 30 minutes for diagnostic exams, which is a decrease from 1997 when the standard time was between 30 and 45 minutes.

Patient Notification: The majority of facilities, 87%, will notify the patient's physician if a biopsy recommended on the basis of breast imaging has not been performed. Fifty-six percent of facilities will go further and re-contact the patient themselves if the biopsy hasn't been performed.

NEW TOPICS ADDRESSED IN THE RECENT BREAST IMAGING SURVEY

Interventional Breast Procedures: Only 19% of facilities (13/68) have participated in the American College of Radiology Accreditation Program for stereotactic biopsy. Thirty-four percent of facilities do perform stereotactic procedures with about half of those facilities using the table unit and half using the upright attachment stereotactic system. Sixty-six percent of practices perform ultrasound guided breast biopsies and only 4% use the Advanced Breast Biopsy Instrument (ABBI) system. (There is a bias in that information as the ABBI system is primarily used by surgeons and they would not likely be represented at a radiology meeting.)

Nineteen percent of those performing breast interventions do it in conjunction with another department, usually a surgery or vascular lab.

Fifty-eight percent of facilities perform fine needle aspirations with ultrasound guidance.

The overall trend is an increase in the number and type of breast interventions. However, there has been no accompanying increase in the American College of Radiology voluntary accreditation program.

Computerized Mammography Reporting Systems: Sixty percent of facilities have some type of computerized reporting system and of those who don't, 60% are planning on purchasing one within the next 12 months. The American College of Radiology requires a practice audit of all interpreting radiologists as to their

individual and group positive predictive values in the detection of breast cancer. In the future this audit will be expanded to include information on call back rates for radiologists as well as determine a facility's ability to detect early stage cancers and false negative rates.

DISCUSSION

The purpose of this survey is to follow trends across the state in regard to breast imaging. This area of imaging continues to evolve at a rapid pace. This is in part due to combined controlled trials which demonstrate decreased mortality in the screened population.[4] A second reason is the continued emphasis by public health organizations, medical organizations such as American Cancer Society, American Medical Association, and the media as to the importance of early detection of breast cancer. In June 1999, the American Medical Association joined the American Cancer Society and American College of Radiology in recommending annual screening mammography for women 40 years and older.[5]

Mammography continues to be the best imaging tool for the detection of early breast cancers. Mammography does have a well documented false negative rate ranging between 2 and 9 percent depending on the study.[6] Ultrasound and magnetic resonance imaging play important ancillary roles. Ultrasound is quick, noninvasive, and relatively inexpensive. However it's role at the present time is for the evaluation of a palpable abnormality or a specific mammographic abnormality. It is not suitable for calcification analysis. Magnetic resonance imaging is time consuming, invasive due to the required administration of an IV contrast agent, and expensive. However it is helpful with a problem case where the cancer is only visible on one view on mammography or evaluation for other areas of tumor involvement in a woman with a dense breast who requests breast conservation.

Public awareness as well as money for women's health programs have increased over the past decade. Health care administrators are beginning to realize that the majority of health care decisions are made by women and there has subsequently been a concerted effort to cater to this patient demographic.[7] This was very noticeable in our survey. Now approximately 26% of our surveyed facilities were involved with a "women's imaging center" compared to 11% 2 years ago. In addition, the mammographic facilities are increasing in size. Now 58% have at least 2 mammographic units at each site whereas 2 years ago 83% of screening facilities had only one unit.

Despite the increase in women's imaging centers and number of mammographic units per facility, there hasn't been an increase in the number of facilities which provide a coordinated physical exam of the breast in the radiology department along with the mammogram. This was fairly constant-currently at 20% compared to 23% in 1997.

Prior mammograms can be crucial in evaluating the present mammogram. If a mammographic finding is stable over an extended time period, it is extremely unlikely to be malignant. In addition, stable changes don't require the additional work-up of a call back mammogram with diagnostic views or another ancillary study such as an ultrasound or magnetic resonance imaging study. From a risk management point of view, comparison with previous radiographs lessens the chance of a medical malpractice suit and increases the physician's successful defense.[8] Mammography facilities continue to acknowledge this as 75% of institutions request the patient bring her prior films if they were performed elsewhere and 96% of facilities will attempt to retrieve them before a final report is issued. In our prior survey 82% of facilities requested the patient obtain her outside films prior to her exam and 93% attempted to obtain the films prior to the generation of the final report. Acquisition of prior studies adds significant cost to the breast imaging budget, ranging from $12.52-$21.49.[9,10]

The number of self-referred mammography patients has increased from the prior study when it was 50% to 67% currently. This is not surprising. Radiologists are becoming more comfortable with the role of primary care providers for breast problems. Due to rapid advancement of minimally invasive percutaneous tissue sampling procedures, the radiologist is now able to identify a breast abnormality with imaging but also in conjunction with cytopathology colleagues provide a diagnosis and direct the patient toward further workup if indicated (for malignancy) or resolution of the problem (a benign breast disorder).

The Mammography Quality Standards Act (MQSA) Reauthorization Act of 1998 has mandated a significant change in the way the communication of mammography reports are managed. Due to new federal regulation, all mammography facilities must send a report of the patient's mammogram to her which in lay terminology explains her mammographic findings.[11] The vast majority of screening facilities, 97%, do not inform the patient of her results at the time of the exam but mail her the report. However, 37% of diagnostic facilities are providing the patient with a report before she leaves the department.

Breast compression issues have not changed over the past 2 years. Adequate compression is essential in obtaining a high quality mammogram and is one of the main factors evaluated by the American College of Radiology breast accreditation reviewers when they evaluate facilities in order to receive accreditation.[12] The majority of patients will work with the technologist in tolerating compression if the technologist

explains its importance in producing a higher quality mammogram with decreased dose.

Interestingly, there has been an increase in the percentage of institutions obtaining written consent from the patient with breast implants before performing her mammogram. In 1997, 10% of facilities obtained consent but this has increased to 32% presently. This may be due to the threat of litigation.

There has been a significant increase in the number of women obtaining mammograms as evidenced by backlog problems experienced by virtually all facilities participating in our survey. Forty-three percent of screening facilities now have a backlog greater than 3 weeks with only 4% of facilities able to accommodate patients within 1-3 days of a request. Most facilities hold emergency appointments open for patients with an acute breast problem which is reflected by the fact that 91% of facilities were able to accommodate these acute patients within 14 days. However, this backlog problem will continue to be compounded as more women enter the medical system and more women are put into the annual screening schedule instead of the biannual schedule.

The definition of screening and diagnostic mammograms are less problematic with the change in the Medicare reimbursement rules.[13] Prior to this change which occurred January 1, 1998, a woman who had a history of breast cancer and subsequent mastectomy was classified as a diagnostic exam. This allowed her a yearly mammogram which is important for a woman with the increased risk factor due to a prior breast cancer. However, the remaining breast being evaluated was normal so there was no real indication for the radiologist to check those films "online." Medicare rules were such that yearly mammogram were covered only for diagnostic studies. Fortunately, Medicare has adjusted and now covers mammograms 11 full months from the past exam which negates the issue of post mastectomy classification. Fifty-six percent of facilities now consider post mastectomy patients to be diagnostic, decrease from 69% in 1997. This will likely continue to decrease over time.

The amount of time allotted by facilities for screening exams has remained relatively constant at 30 minutes. The time allotted for diagnostic exams has decreased slightly to 30 minutes. It is unlikely this time can decrease much further in that the patient changing time, form completion, and checking films prior to patient release will continue to limit expediency of room turnover.

The area expanded in the recent survey was breast interventional procedures. Many facilities aggressively market their interventional programs. One-third of all facilities now have stereotactic biopsy capabilities. Two thirds of all surveyed facilities offer ultrasound guided breast biopsies. One half of the facilities offer fine needle aspiration services. A small percentage of facilities work jointly with another department but the majority work independently. The ACR has started voluntary interventional breast procedure accreditation programs similar to their initial voluntary mammography accreditation program in the 1980s. There are currently American College of Radiology accreditation programs for both stereotactic breast biopsy procedures and US guided breast biopsy procedures. The FDA subsequently expanded the voluntary mammography accreditation program to institute mandatory mammography accreditation. Only 19% of the surveyed facilities performing interventional procedures are participating in the voluntary stereotactic ACR program at this time. This low participation rate is not unique to Wisconsin. Nationwide, only 13% of stereotactic breast programs are enrolled in either the American College of Radiology or American College of Surgeons accreditation programs.[14] It may be the FDA will follow the same course of action regarding interventional breast accreditation as it did towards mammography accreditation.

Partly in response to increased requirements of the accreditation processes, patient notification letters, and the increased number of mammographic exams, the majority of mammography facilities, 60%, are using a computerized reporting system. Of those who don't have such a system, 60% are planning on acquiring one in the next 12 months. This is a direct reflection of increased patient volumes and increased audit and record keeping requirements that make recording by non-computerized methods tedious and time-consuming.

This survey is a snapshot of the breast imaging issues and solutions being practiced across the state. Several trends are evident; breast imaging and breast interventions are increasing at a rapid rate with increasing roles for the medical imager in the diagnosis and management of breast disease. The main bias of this survey is the method of distribution; in that only participants in the University of Wisconsin Mammography Update Continuing Medical Education course were sampled. However, information from this survey can be used by mammography facilities to help plan for the future.

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Michael J. Dunn, MD

Dean's Corner

Hats Off to MCW's Volunteer Clinical Faculty

Michael J. Dunn, MD, Dean and Executive Vice President, Medical College of Wisconsin

The 868 physicians and scientists on our full-time faculty comprise one portion of the team that educates tomorrow's doctors and specialists at the Medical College of Wisconsin. For our students and residents, the medical school experience would not be complete without the added time and talent of our volunteer clinical faculty members.

It is humbling to hear some of these physicians talk about their commitment to teaching without compensation as a personal, sacred duty to medicine. They are not welcoming students and residents into their practices for any amount of recognition or the prestige attendant to a faculty appointment. They teach because, whether they graduated from this medical school or not, they feel motivated to give back to their profession. For our alumni, of course, there is the added dimension of maintaining strong ties to the *alma mater*.

The influence these volunteers have on medical students and residents goes well beyond transferring clinical skills. In spite of the financial pressures under which private practice physicians operate, these men and women contribute their time to teach particularly by example. Volunteer faculty members create islands of pure education in the sea of bottom-line medicine.

I want to formally thank these men and women who share their skill and experience. To recognize the important role that volunteer clinical faculty play in educating our students and residents, I recently created the position of Associate Dean of Volunteer Clinical Faculty, and appointed Russell Robertson, MD, Associate Professor of Family and Community Medicine, to the position. Doctor Robertson is coordinating enhanced support of our clinical faculty, integrating them more closely into the Medical College community. While much contact and recruitment still takes place at the department level, Dr. Robertson's efforts are creating a more tangible relationship between volunteer faculty and the College as an institution. We are making the College's library and information services more accessible to them, arranging ticket discounts with Milwaukee sports teams and cultural groups, and plan to provide other forms of recognition and expressions of our gratitude. Doctor Robertson has compiled a manual for volunteer faculty, scheduled to be in their hands by early October, detailing these initiatives.

Even though our volunteer clinical faculty may avow that they do not seek recognition, it is due nonetheless. Their contributions help the College provide cost-effective medical education. National trends in medicine, from the growth in ambulatory care to decreases in Medicare/Medicaid payments to teaching hospitals, are real challenges that would be difficult for medical schools to face without access to the expertise that exists in the community beyond campus. We truly rely on our volunteer faculty to round out the experience of our students and residents.

Through their clerkships with volunteer faculty, students and residents are exposed to medicine at the practice level – a very valuable experience and very different from the perspective they receive in an academic medical center. They see physician-patient relationships that have lasted for years rather than the course of an acute condition. They see undifferentiated patients who present with their symptoms rather than a referral and a dossier of images and test results. Here is where our students can hone their history taking and communication skills.

Students and residents also observe a host of details unrelated to patient care while in these private practices. They see the interaction of physicians with clinic staff, observe the stresses and lifestyle demands inherent in some specialties and benefit from the camaraderie of their preceptors. All this input contributes to making informed decisions about residency, fellowships and further career options.

How appreciative are students for this private practice perspective? Our students have bestowed teaching awards on volunteer faculty just as they acknowledge our full-time faculty. Several clerkships, including pediatrics, internal medicine and family medicine — taught primarily by volunteer faculty — receive consistently high ratings from students. They know that the lessons they are learning will shape their careers in medicine.

It is my hope that the Medical College's volunteer clinical faculty feel justifiable pride in the work they do with MCW students. We are certainly proud to have them associated with our medical school.

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- Drinking water analysis
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MetaStar Launches Initiative to Increase Dilated Eye Exam Rate Among Medicare Beneficiaries with Diabetes

Jay A. Gold, MD, JD, MPH; Dennis Spurlin; and Judy Frisch, MSN

Thousands of people lose their sight from diabetic eye disease every year. A simple eye examination could reduce that number by half, yet many diabetic patients do not receive such examinations on an annual basis.

MetaStar, Inc., the Health Care Financing Administration, the American Academy of Ophthalmology (AAO), and the American Optometric Association (AOA) have launched a cooperative effort to increase the dilated eye exam rate among Medicare beneficiaries with diabetes.

Nationally, about 10 percent of the Medicare population is diabetic. In Wisconsin, this amounts to nearly 80,000 beneficiaries. The joint initiative seeks to increase the eye exam rate among Medicare beneficiaries by:

- increasing public awareness of the connection between diabetes and blindness; and
- removing barriers such as payment and transportation issues that prevent diabetics from getting dilated eye exams.

The targeted populations for this intervention are Medicare beneficiaries who have not had an eye exam in the past three years (three-year group), and those who have not had an eye exam in the past two years (two-year group).

As part of the campaign, MetaStar will inform Medicare beneficiaries of the AAO and AOA programs through a series of postcards and brochures sent to qualifying beneficiaries reminding them to get a dilated eye exam. In addition, the mailing will ask whether transportation is needed, and will offer a toll-free number beneficiaries may use to arrange for a ride to the physician's office. Bill Cosby will be featured in a MetaStar television PSA urging persons with diabetes to schedule eye exams.

In addition, a mailing will be sent to primary care and internal medicine physicians, endocrinologists, physicians assistants and nurse practitioners informing them of the campaign. The letter will explain the program and ask for their support and referral.

The AAO and the AOA have developed a joint intervention that makes it easier for Medicare beneficiaries to get eye exams by reducing or eliminating the co-payment. While the three-year group will be offered co-payment elimination, the two-year group will not.

The Foundation of the American Academy of Ophthalmology's EyeCare America National Eye Care Project (NECP) is for Medicare beneficiaries age 65 and older who have diabetes and have not had a medical eye exam in the last two or three years. NECP matches qualifying persons with a volunteer ophthalmologist in their area who has agreed to provide a comprehensive medical eye exam and up to one year of follow-up care for any condition diagnosed at the initial exam, with no out-of-pocket expense to the patient.

The deductible (and co-payment for the three-year group) are waived, and Medicare is accepted as payment in full. For further information regarding the NECP program, beneficiaries can call 800.222.EYES (800.222.3937) 24 hours a day, seven days a week. Medicare diabetes patients may also qualify for help in receiving an eye examination by calling AOA's Diabetes Hot Line. This program matches patients with a participating optometrist in their area who has agreed to perform a dilated eye examination and provide or arrange for subsequent care. In cases of financial need, the optometrist may be able to waive the deductible and co-payment a Medicare patient usually pays. AOA's Diabetes Hot Line is 800. 262.3947. Operators are available from 7 a.m.–7 p.m. (CST) Monday through Friday.

Another barrier preventing Medicare patients with diabetes from receiving eye exams is lack of transportation. MetaStar has identified several state and local community organizations such as the Lion's Club and RSVP that can provide transportation to eye appointments for Medicare beneficiaries.

While the AAO and AOA programs are ongoing, MetaStar's effort with the postcards, letters and PSA campaign will take place between November 1, 2000 and May 31, 2001. For further information regarding the intervention, contact MetaStar at 800.362.2320.

Authors are with MetaStar, Inc. Doctor Gold is Senior Vice President and Principal Clinical Coordinator; Mr. Spurlin is Communications Specialist; Ms. Frisch is Clinical Quality Specialist.

WMJ Instructions to Authors

AUTHORSHIP

Manuscripts are considered with the understanding that they have not been published previously and are not under consideration by another publication.

Each scientific and socioeconomic manuscript must be accompanied by a cover letter containing the following sentence: "In consideration of the *Wisconsin Medical Journal's* taking action in reviewing and editing this submission, the author(s) hereby transfer(s), assign(s), or otherwise convey(s) all copyright ownership to the *WMJ* in the event that this work is published in the *WMJ*." All co-authors must sign the letter.

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Organization for scientific papers. The following outline is recommended:

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Results-Provide results in the test, tables or illustrations. If tables or illustrations are used, emphasize or summarize only the most important observations in the text.

Discussion-Discuss the conclusions that follow from the results, as well as their limitations and relations to other studies. Show how the conclusions relate to the purpose of the study. Recommendations, when appropriate, may be included.

References-Limit to 20. Authors are responsible for the accuracy and completeness of references. References must follow AMA style and abbreviations of journal names must follow those in *Index Medicus*. Consult the *Wisconsin Medical Journal* for examples of proper form.

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Avoid the use of medical jargon. Words or phrases that are particular to conversations among medical personnel are inappropriate in scientific writing. (Examples: For "presented with" use "had;" for "experienced a weight loss" use "lost weight.")

Supply the full and correct names of drugs. Use generic names of drugs, unless the specific trade name of a drug is directly relevant to the discussion. If the author so desires, brand names may be inserted in parentheses.

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- The conference brochure should accompany the report. It will not be published.

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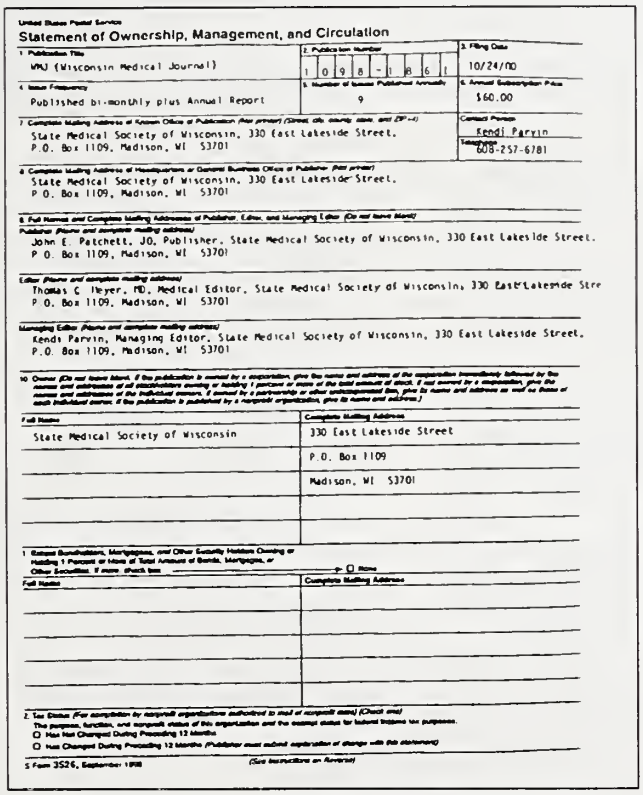

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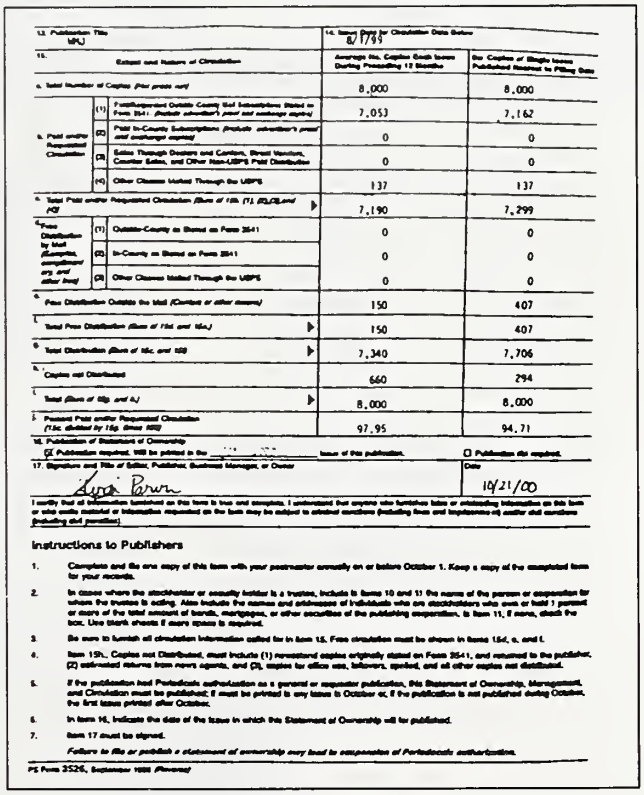

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j. Percent Paid and/or Requested Circulation (15c. divided by 15g. times 100)	97.95	94.71

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ume 99, No. 8

WMJ

November 2000

Environmental Health

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Challenges for the 21st Century

November 1, 2000

Mr. William T. Montei, CEO
Physicians Insurance Company
of Wisconsin
1002 Deming Way
Madison, WI 53717-1938

Re: Wisconsin Patients Compensation Fund v. Physicians Insurance Company of Wisconsin, Inc.;
2000 WL 1460099 (Wis. Ct. App.), October 3, 2000

Dear Bill:

On behalf of the State Medical Society and Wisconsin physicians across the state, we are writing to thank and congratulate PIC Wisconsin for its success on our behalf against the Patients Compensation Fund in the above-referenced appellate case.

The result secured by PIC Wisconsin represents an important victory for Wisconsin physicians and non-physician providers. But for PIC Wisconsin's willingness to take a stand against the Fund on the issue of protecting the confidentiality of communications between physicians and their lawyers, the ability of physicians to protect themselves against contribution claims or other causes of action by the Fund would have been severely compromised.

This landmark decision in favor of the rights of physicians would not have been possible but for your leadership and the willingness of PIC Wisconsin to fight for Wisconsin physicians and non-physician clinicians. We note that your competitors left you to take the lead on this important effort--some even criticized and opposed PIC's position, compromising a physician's relationship with his/her attorney. It should come as no surprise that PIC Wisconsin--as a physician-founded and owned organization which insures more Wisconsin physicians than any other insurance carrier, would be the only insurance carrier willing to go to court against the Fund to protect the rights and interests of Wisconsin physicians and healthcare providers.

A heartfelt thank you from all of us!

Sincerely,

Ayaz M. Samadani, MD
President

John E. Patchett, JD
Executive Vice President

Thomas C. Meyer, MD

Editorial

Radon, Ozone, Asthma, Lead: *WMJ* Delves into Environmental Health

by Thomas C. Meyer, MD, WMJ *Medical Editor*

This issue, which examines environmental health, is the fourth in our series of five dealing with public health in Wisconsin. In his introduction (p 9), John Chapin reintroduces us to "Turning Point" — the public health agenda for the years up to 2010 being developed by the Department of Health and Family Services. Implicit in his article is the plea that we support the Department's political, budgetary and implementation efforts to ensure truly measurable progress.

Environmental health is a large and somewhat amorphous concept that is hard to relate to the everyday practice of caring for a large number of patients with real and immediate problems. Anderson and Sieger (p 10) highlight these briefly and introduce us to factors that need continuous attention in the primary care sector: lead poisoning, food safety, asthma. And what about the water supply, municipal and private wells — who would have thought that up to 30,000 Wisconsin wells are contaminated with arsenic? Equally, who would have thought that there is all sorts of naturally-occurring radon lurking in various Wisconsin counties? Add to these the problems of PCBs in fish and the hazards of carbon monoxide, and one's innate paranoia thrives! The authors are kind enough to inform us of the state's readily accessible Environmental Health Resource directory to assuage our anxiety about keeping timely references at hand.

Subsequent papers in the journal's peer-reviewed section expand on Anderson and Sieger's introduction. Lead poisoning in children and adults occupy the first three articles. LaFlash and colleagues review the incidence and recommendations for lead screening in children (p 18). They suggest that asking the age of the house in which a child lives should be among the screening items in well-child visits. (Sounds as if most houses over 50 years old are dripping in lead!) The authors exhort us to be as vigilant with 2 and 3 year olds as we are with 1-year-old children. Garman and colleagues (p 25) provide background and case studies relating to lead poisoning in adults as well as some interesting tidbits.

Weisskopf et al (p 30) disabuse us of the commonly-held belief that transportation-related ammonia accidents are the most common ways released ammonia becomes a threat. The pesticide as possible endocrine disruptors (p 34) is interesting but heavy going, mainly because of the unavoidable use of unfamiliar chemicals in the herbicides, fungicides and insecticides. It becomes rather like a Russian novel where one has to go back to see whether this character/chemical is the same as a previously-mentioned character/chemical! Fortunately, Johnson and co-authors have mercy and provide a table (p 37) of the chemicals' common and trade names.

Weiffenbach and Anderson (p 39) come up with the startling fact that up to 10% of tested Wisconsin homes have average radon levels on the first floor that exceed EPA exposure guidelines, and that the gas is dissolved in some community wells at an unacceptably high level. Maps allow us to check whether our locality is one at risk, and the authors provide guidelines for getting rid of any that is found. Steenport et al (p 43) report on a study of the (lack of) knowledge of a small group of people fishing on the PCB-contaminated Fox River relating to the warnings about the dangers of the consumption of their catches.

Daggett and colleagues provide a useful review of the how's and why's of ozone and particulate matter leading to air pollution (p 47). They describe how much is present or released into Wisconsin air and where monitoring stations are located. There has been improvement in the levels of these pollutants, but this has not affected the respiratory disease admission rate - an observation shared by Fiore and colleagues (p 52) in their manuscript reviewing asthma hospitalizations in Wisconsin in the last 10 years.

Our next issue will deal with injury prevention, which will complete this public health series. The Editorial Board has selected *WMJ* themes for 2001: physician wellness, firearms, alternative medicine, management of chronic pain, end-of-life issues, patient safety, and outcomes research. We are anxious that authors who are willing to prepare manuscripts on these topics inform Kendi Parvin, *WMJ* managing editor, by calling 800.362.9080 or e-mailing kendip@wismed.org. We hope to make these issues as interesting and informative as possible, and, as always, we are anxious to receive manuscripts on other topics of interest as well.

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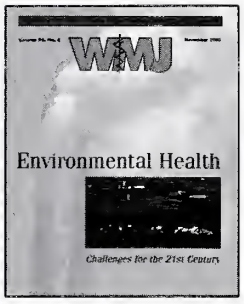

COVER THEME ENVIRONMENTAL HEALTH

At the turn of the 20th Century, addressing basic sanitation issues was high on the public health agenda. Great strides have been made in the last 100 years, but today lead poisoning, pollution, asthma and clean water are significant issues facing Wisconsin's environmental health community. In this issue of WMJ *we explore some of these issues and steps physicians can take to ensure their patients' 'environmental health.'*

Cover design by Kendi Parvin, *WMJ* Managing Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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Too Many Treatments for Parkinson's Disease: Another Look

In August, *WMJ* published a letter from Dr. Paul Nausieda of Milwaukee, which was highly critical of the content of my article on medical and surgical treatments in Parkinson's disease, which had been published earlier in the year (WMJ 2000; 99: 57-61). At the time, I was not given the option of rebuttal, the usual format for dialogue in these situations. In his rush to command respect from his physician audience, Dr. Nausieda took liberties in reprioritizing sentence structures from the article to make it appear that I was making bad medical recommendations, which, in his opinion, should put all of us on litigation alert.

He states in his letter that I suggested using risperidone, olanzepine, or haloperidol in the treatment of psychosis, and such drug choices were potentially lethal in Parkinson's patients. As an alternative he recommends quetiapine and clozapine because these are the only safe drugs available for this purpose. He neglected to tell us that quetiapine is extremely variable in its required dosing for acute antipsychotic use and that clozapine requires weekly CBC's for the first 6 months, then every 2 weeks for the next 6 months and weekly for a month after discontinuation to guard against potentially fatal agranulocytosis.

I purposely kept haloperidol, a typical antipsychotic, as a separate treatment category, to be used as a last resort when psychosis is refractory and then to use it only for a few days. Risperidone, clozapine, olanzepine and quetiapine were mentioned together as "atypical antipsychotics" to be considered only after psychotic signs are not relieved by lowering doses of antiparkinson drugs. These four neuroleptic agents are called "atypical" because their antipsychotic actions are rarely accompanied by Parkinsonian syndromes in psychiatric populations. The "atypical" property makes these four drugs much more desirable than the conventional neuroleptics, which clearly pose the risk of further Parkinsonian signs by their blocking action at D-2 receptors. Whether or not a specific "atypical antipsychotic" is well tolerated by a specific Parkinson's patient depends on that patient's particular configuration of receptor subtypes (D-1 through D-4) and how it matches the drug chosen.

I believe that litigation potential is minimal when the experienced physician follows the patient carefully for side effects and the drugs are dosed or switched to insure that: 1) the patient feels well; 2) the medication has a desired therapeutic effect without the return of Parkinsonian signs; and 3) that no other major systemic effects, cardiac or otherwise, have or will occur.

Recommendations to lay patients to avoid certain drugs that might be detrimental is one thing (use of Dr. Nausieda's warning cards) but a physician's knowledge base of drug effects is a different situation. A recent review of treatment of psychosis is given in Friedman, J.H. and Factor, S.A. "Atypical antipsychotics in the treatment of drug-induced psychosis in Parkinson's disease," Movement Disorders 15(2000): 201-211.

However, one criticism of that article is that it generalizes and does not put any emphasis on the fact that heterogeneity in receptor subtype configurations exist (that people are different) and successful treatment outcomes are due to careful tailoring of medication programs. Overgeneralization of treatment options and failure to tailor medication can lead to poor patient outcomes and a litigation response. Consultative guidance from a neurologist experienced with synaptic adjustment is the best way to avoid such difficulties.

I certainly agree with Dr. Nausieda that stereotactic surgery be reserved for patients with refractory on-off effects or major limitations in drug dosing requirements. However, a characterization of stereotactic surgery as a form of frontal lobotomy is entirely unwarranted. Bilateral thalamotomy should be avoided because of potential memory loss. Most patients in our hands receive either dominant hemisphere (for bilaterally symmetric symptoms) or single pallidal lesions corresponding to the symptomatic side. Combinations of surgery involve thalamotomy on one side with pallidotomy or deep brain stimulator placement on the other to avoid bilateral thalamotomy in severely debilitated patients where combinations are required. Only one patient required bilateral pallidotomy (6 months between surgeries) to eliminate refractory and debilitating on-off fluctuations in motor performance from over- aggressive Sinemet and agonist use, typical practice in some of the larger Parkinson's programs in North America. Careful patient selection using a variety of presurgical scanning procedures and formal neuropsychological testing helps to avoid performing surgeries on patients with early dementia or microinfarct states that predispose to dementia.

Lastly, I will concede that Lodosyn has become available in prescription form since this article was accepted and is available at major expense from DuPont. If necessary, it can be used in tailoring medication programs to selected patients.

Norman C. Reynolds Jr., MD
Associate Professor of Neurology
Medical College of Wisconsin

• • •

A recent letter to the *WMJ* by Dr. Paul Nausieda contains statements regarding surgical options for Parkinson's disease that may be misleading to those not familiar with these procedures or with the current literature. While the vast majority of patients with Parkinson's disease or essential tremor remain well-controlled on medical therapy alone, a significant number become treatment-resistant. For these individuals, stereotactic procedures such as pallidotomy and deep brain stimulation offer new hope. Having had the opportunity to treat over 150 patients since April 1996, our experience at Marshfield has not reflected Dr. Nausieda's and we offer the following clarifications:

1. "While Dr. Reynolds reports remarkable success in treating tremor (with surgery), this has not been our own experience nor that reported in

the literature." In fact, practically all published series on the treatment of tremor with deep brain stimulation (DBS) have demonstrated this to be a safe and effective modality with typical results showing 80+% tremor reduction.[1-7] Our experience with 60 DBS implants of thalamus and subthalamic nucleus has been that virtually all patients have experienced significant and often dramatic tremor reduction.

2. "It should also be stated that surgical morbidity is a real concern," implying that risk of intracerebral hemorrhage outweighs therapeutic benefits. Most reports indicate an operative morbidity of under 5%. Kumar[3] summarized the Toronto group's findings by stating that in only 1 patient out of 40 did disability from complications outweigh the motoric benefits from surgery. Outcome from any surgical procedure is of course center-specific.

3. "These patients look very much like they have received frontal lobotomy." Two recent large studies[8,9] on neuropsychological outcomes after pallidotomy found that cognitive changes (for example in verbal memory) were minimal compared to the robust improvements in motor function. The Baylor group in fact reported "significant improvements in confrontational naming, visuospatial organization and affective functioning 3 and 12 months after surgery." No mention was made of lobotomy-like effects.

Medical care providers unfamiliar with these surgeries are often disinclined to consider them for their patients because of a concern that these procedures are dangerous, too invasive or even "experimental." The procedures are actually minimally invasive, done largely with the use of probes no larger than 1.8 mm in diameter, and there is now a wealth of literature supporting their benefits. Another mistaken assumption is that only the most severe or "end-stage" patients are candidates. In point of fact these procedures are best thought of not as a "last resort," but rather as an option for those individuals still in the moderate range but sliding downhill. The healthy non-demented patient having to take more and more medications to achieve less and less quality "on" time is an ideal candidate for surgery.

Bradley C. Hiner, MD
Marshfield Clinic

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AMA Awards

The SMS member physicians listed below recently earned the AMA's Physician Recognition Award. They have distinguished themselves and their profession by their commitment to continuing education, and the SMS offers them its congratulations.

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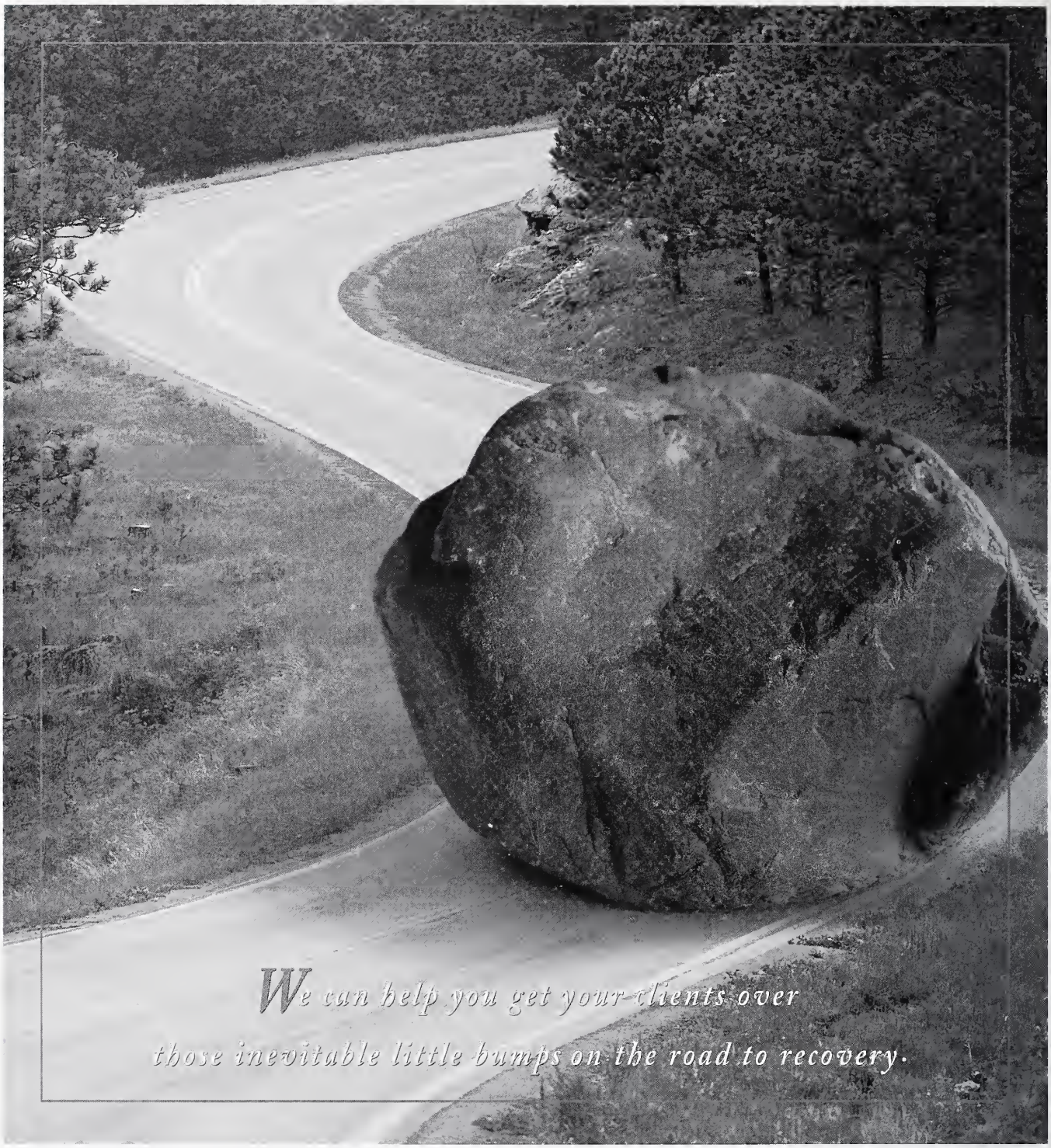

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In Remembrance

Betlach, Eugene H., MD, 79, of Janesville, passed away October 16, 2000. He received his medical degree from the University of Wisconsin, completed his internship at St. Joseph's Hospital, Phoenix, AZ, and a radiology residency at University Hospitals, Madison.

Doctor Betlach served as an instructor of radiology at University Hospitals in Madison for the Department of Radiology from 1952 until 1953, after which he was a consulting radiologist for the VA Hospital, Madison. He practiced in Janesville, Fort Atkinson and Edgerton. His memberships included the American College of Radiology, Radiological Society of North America, AMA and SMS. He was a past president and chief of staff at Mercy Hospital in Janesville and member of the 1996 SMS 50 Year Club.

Doctor Betlach is survived by his wife, Dorothy; his children, Michael (Paulanne Chelf), Fitchburg, Stephen (Marsha Elmer), Ankeny, IA, David, Janesville, Ann (Dave Wade), Mequon; and seven grandchildren, Elicia, Madeline, Jeremy, Aaron, Abbey, Eric and Matthew.

Collentine, George E., MD, 79, of Mequon, passed away October 19, 2000. He earned his medical degree from Marquette University School of Medicine, completed his internship at St. Mary's Hospital, Milwaukee and surgery residency at the VA Hospital, Wood.

Doctor Collentine received the 1988 SMS Presidential Citation for his leadership in a multitude of socioeconomic issues both on a national and state level, service on the AMA Council on Medical Service and Wisconsin Delegation to the AMA. He was the director of the St. Mary's Hospital Burn Center for 27 years and served as president of the Milwaukee County Medical Society. He was also a member of the 1993 SMS 50 Year Club.

Doctor Collentine is survived by his wife, Patricia; his children, Kathleen (Edward) Ryan, Anne (Paul) Kessenich, Dr. Thomas (Judy), William (Christine) and Michael (Christina); grandchildren, Ann (Brian) Brixie, Kevin (Sarah), Christopher and Ellen Ryan, Marian and Ramona Collentine, Maureen, Andrew (Brooke), Katie and Joseph Kessenich, Sarah, Catherine and Will Collentine; and great grandchild, Claire Brixie. He was preceded in death by a grandson, Ted Ryan.

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How to Measure the Success of Public Health

John Chapin, Administrator, Division of Public Health

There are currently many different empirical measures of the health of Wisconsin. The University of Wisconsin – Network for Health Policy Research has its "Wisconsin County Population Health Check Up," which has its own matrix and measures for a county-by-county analysis. Department of Health and Family Services Secretary Joe Leean has identified 50 statewide "scorecard" measures, 23 of which are related to public health. The Bureau of Health Information within the Division of Health Care Financing develops annual county profiles for the Division of Public Health (DPH). The Centers for Disease Control and Prevention, working with the Association of State and Territorial Health Officers, is developing cross-nation county comparison statistics. The Federal Government has published its "Healthy People 2010" goals and objectives in two volumes with over 400 measures. Wisconsin is developing, via the Turning Point process, its own 2010 measures based around risk factors. Beyond these there are scores of "health index" measures such as the IHQ Quality Index and the Northwestern National Life Insurance Company's annual ranking, to name just two.

Public Health is awash in data; but that does not always translate into relevant policy information. The focus on the empirical side requires that the right measures are defined if they are to have political impact. In a previous guest editorial (*WMJ 2000; 99:11*), I indicated that the 1989 "Healthy People 2000" document, which is the basis for many of these articles, never became a political reality. It contained a hodgepodge of nearly 300 objectives independent of their relative importance to the health of the public. Many of the objectives were vague, most could not be measured accurately, and for many, no data whatsoever existed. The targets were usually heroic given the resources available and those that were reasonable, measurable and for which data existed are usually influenced by so many societal, economic and cultural factors as to make causality between specific public health programs and outcomes completely "unscientific" as social science.

For 2010, Wisconsin is trying to avoid the fatal flaws of the 2000 document. In Wisconsin we need the right measures linked to programs that are accountable for those outcomes. Through the Turning Point process, a panel of experts (including many SMS members) is selecting a very few risk factors as objectives and goals, rather than taking "a disease of the week" approach to indicators. These are based on an analysis by magnitude and severity of Wisconsin's health problems. We are not just adopting the objectives identified in the federal government's 2010 document. We are looking for a handful of targeted risk factors, which impact many disease conditions to insert into the political process of legislation and funding.

During this decade the Division of Public Health will work to link these key risk factors with specific programs. Turning Point will also afford the opportunity to have the legislature adopt these state health plan objectives as Wisconsin's goals and objectives. Then one has the linkages of accountability and causality that need to exist.

Creating meaningful measures of the state of public health in Wisconsin should be an obvious joint priority of the SMS, DPH and the public health community. The equally important joint goal should be to ensure bipartisan political buy-in, program dedication and resource allocation towards improving those measures.

Environmental Health in Wisconsin – Challenges for the 21st Century

Henry Anderson, MD; Thomas Sieger, MS

Judith Walzer Leavitt, in her book *The Healthiest City – Milwaukee and the Politics of Health Reform,* describes in significant detail the public health battles waged over basic sanitation in a rapidly growing urban environment at the turn of the 20th century.

> "Many urbanites saw sanitation as the city's most pressing problem, in part because filth was omnipresent and a popular medical theory taught that dirty environments caused disease. In their efforts to improve the health statistics of the city, Milwaukee health officers either directly controlled or monitored garbage collection and disposal, sewage systems, water supply, privies and other nuisances, and industrial pollution."[1]

Milwaukee, under the guidance of the Health Department went on to successfully address basic sanitation issues. These efforts, together with focus on infectious disease prevention and food safety, led to significant improvements in the health of the public during the early 20th century.

As we come to the start of a new century, it is often easy to take for granted the significant advances in environmental health, that along with other public health prevention measures and improvements in our health care systems, have contributed to a 30 year average increase in life expectancy. However, we thought it might be instructive to take a close look at Wisconsin residents' perceptions and concerns about environmental health, discuss some of the environmental health challenges facing us in Wisconsin in the next century and highlight some resources available to the medical community as we work to address these concerns. Several of these issues are addressed in greater detail in articles within this special environmental health edition.

Henry Anderson is Chief Medical Officer for Environmental and Occupational Health; Thomas Sieger is Director of the Bureau of Environmental Health, Wisconsin Department of Health and Family Services, Madison, WI

Wisconsin Residents' Perceptions of Environmental Health

A recent survey prepared by the Princeton Survey Research Associates for the Pew Charitable Trusts provides insights into how the Wisconsin public feels about environmental health and environmentally related health risks.[2] The survey was conducted among 802 registered voters in Wisconsin; the results were compared with similar survey information nationwide in nine other states. The results, some of which we will discuss, clearly indicate that Wisconsin residents are worried about environmental health risks and the potential to negatively impact their health. Table 1 illustrates data from the survey indicating that a majority of the Wisconsin residents surveyed see environmental factors as an important cause of disease. Fully half of the residents surveyed feel environmental factors are a very important cause of disease. Wisconsin resident perception was similar to concerns expressed by those surveyed nationwide, i.e. approximately 50% saw environmental factors as an important cause of disease.

The question response indicated in Table 2 indicates the type of environmental health concerns residents are worried about in terms of causing disease. Over half of the residents surveyed indicated very serious concern with contaminants from toxic waste and contamination of drinking water. Many residents also see air pollution, water pollution and pesticide contamination of food as very serious issues. Here also, Wisconsin perceptions were very similar to those of the United States.

Table 3 indicates how Wisconsin residents feel about specific diseases – with respect to environmental causation. Fifty-two percent of residents feel that environmental hazards play a major role in the cause of sinus and allergy problems; nearly one-half feel that environmental problems are a major cause of asthma in children and approximately one-third believe that environmental factors are associated with birth defects and cancer in children. When asked whether they or a close family member has ever experienced an environmental problem that has been harmful to their health, the results are very striking. From 23% to 58% of respondents feel that their health, or a family member's, has been impacted by an

Table 1. Importance of Environmental Factors in Causing Disease

	WI	US
Very Important	50%	53%
Somewhat Important	41%	37%
Not Too Important	5%	6%
Not Important At All	2%	3%

Source: Princeton Survey Research Associates. Report of the Findings: National Survey of Public Perceptions of Environmental Health Risks, Wisconsin Component. 2000.

environmental factor (Table 4). Finally, and most importantly for physician readers, 39% of the respondents feel that they need more information about the environment in their community and 40% suggest that that they would like more information about what they and their family members can do to protect themselves from environmental health problems (Table 5). In this respect, however, it is interesting to note that Wisconsin residents appear to be more satisfied that they are receiving enough information when compared with the nationwide results.

Concerns We Face in the Next Century

It is clear from the data presented above that the Wisconsin public has concerns about environmental risks and potential health impacts. We thought it might be instructive to present a perspective from the Department of Health and Family Services (DHFS), Bureau of Environmental Health, regarding some of the more significant issues facing the state and local environmental health community.

Childhood Lead Poisoning continues to be a significant environmental health issue in Wisconsin, especially for minority children and children from poorer households. 1999 data indicates that statewide 6% of children ages 0 to 5 screened for blood lead levels exceed the Centers for Disease Control and Prevention guideline of 10µg/dL as compared to 4% nationally. Nine percent of 1 and 2 year olds eligible for Medicaid

Table 2. Severity of Environmental Factors in Causing Disease

	Very Serious	Somewhat Serious	Somewhat Minor	Not a Health Threat	Don't Know
Air Pollution					
Wisconsin	39%	38%	13%	8%	2%
US	39%	36%	14%	9%	1%
Water Pollution					
Wisconsin	46%	33%	13%	7%	1%
US	47%	27%	13%	10%	25
Drinking water that has harmful chemicals or other materials in it					
Wisconsin	52%	28%	12%	8%	1%
US	55%	23%	11%	9%	2%
Pesticides in people's food					
Wisconsin	41%	35%	17%	6%	2%
US	41%	29%	17%	9%	4%
Toxic Waste					
Wisconsin	57%	24%	9%	8%	2%
US	61%	18%	10%	10%	2%

Source: Princeton Survey Research Associates. Report of the Findings: National Survey of Public Perceptions of Environmental Health Risks, Wisconsin Component. 2000.

Table 3. Role of Environmental Factors in Causing Specific Illness

	Major Role	Minor Role	No Role	Don't Know
Sinus and allergy problems				
Wisconsin	52%	35%	6%	7%
US	62%	28%	6%	4%
Asthma in children				
Wisconsin	49%	34%	6%	10%
US	53%	31%	6%	9%
Birth defects				
Wisconsin	35%	39%	10%	15%
US	39%	39%	12%	10%
Cancer in children such as leukemia				
Wisconsin	31%	39%	12%	18%
US	37%	34%	14%	15%

Source: Princeton Survey Research Associates. Report of the Findings: National survey of Public Perceptions of Environmental Health Risks, Wisconsin Component. 2000.

Table 4. Concern That Environmental Factor Has Harmed Your Health, or a Close Family Member's (Wisconsin Response Only)

	Very Concerned	Somewhat Concerned	Not Too Concerned	Not At All Concerned
Lived in community with air pollution	33%	37%	17%	11%
Lived in community with water pollution	44%	32%	18%	7%
Lived in community where water wasn't safe to drink	47%	26%	17%	9%
Lived in community where many people had same health problem	58%	29%	8%	1%
Eaten foods treated with pesticides	23%	39%	25%	13%
Been exposed to toxic waste	43%	28%	17%	11%

Source: Princeton Survey Research Associates. Report of the Findings: National Survey of Public Perceptions of Environmental Health Risks, Wisconsin Component. 2000.

Table 5. Have Enough Information About Environment and Protection

	Yes, Have Enough Information		Would Like More Information	
	Wisconsin	US	Wisconsin	US
The state of the environment in their community	60%	48%	39%	49%
What they can do to protect themselves and their family from environmental health problems	58%	49%	40%	50%

Source: Princeton Survey Research Associates. Report of the Findings: National survey of Public Perceptions of Environmental Health Risks, Wisconsin Component. 2000.

benefits that were screened in 1999 had elevated levels of blood lead. DHFS childhood lead screening guidelines urge all Medicaid eligible children ages 1 and 2 years be screened; however only 30% of Medicaid eligible 1 and 2 year olds were screened in 1999.[3] Physicians play an important role in screening Wisconsin children to identify elevated blood lead levels so that early intervention can prevent the very serious health problems associated with this contaminant (*see articles on childhood lead poisoning – pages 18, 23).*

Food Safety – Public health departments at the state and local level regulate and license 20,000 restaurants within the state of Wisconsin. A significant and growing percentage of our state's population regularly dine out at these facilities. The recent food borne disease outbreak at two establishments in the Milwaukee area illustrates some of the challenges associated with assuring the safety of the food service industry. Nearly 60 individuals became ill and one child died as a result of *E. coli 0157:H7* cross contamination of salad bar entrees by a raw beef product. The DHFS and the Wisconsin Department of Agriculture, Trade and Consumer Protection, a partner in our food safety efforts, are promulgating new food safety rules to offer better guidance to facility operators and afford greater protection to consumers. However, we know that food borne illness is under reported. Physicians can greatly assist us in our disease surveillance activities by referring patients with symptoms of food borne illness to their local health department for investigation and follow-up.

Childhood Asthma – Although asthma is a disease with multifactorial and unknown origins, many environmental factors can trigger an asthma episode and affect the severity and course of the disease. Like the rest of the nation, Wisconsin appears to be in the midst of an asthma epidemic. Data from 1996 – 1998 indicate that the hospitalization rate for children ages 0 to 4 is very high at 38/10,000; a disproportionate number of these visits occur among African American children.[4] In 1999, the *Wisconsin Medical Journal* focused an edition on asthma; also the article by Fiorc et al in this issue provides a comprehensive examination of asthma in Wisconsin.

The primary care community's efforts to adhere to national guidelines for the diagnosis and management of asthma, together with encouraging the use of outpatient health services for asthma management, can decrease the use of emergency room visits for episodic and less effective treatment for this disease. Likewise, local public health departments need to develop and deploy the capacity to provide interventions aimed at decreasing exposure to those household allergens and irritants we know to affect the course of the disease.

Safe Drinking Water – Tremendous advances have been made since the turn of the century when the Milwaukee Health Department struggled to provide a safe and clean water supply for its growing population. The public health community recently celebrated 25 years of improvements to municipal drinking water supplies and distribution systems under the Safe Drinking Water Act. However, it is important to remember that one third of Wisconsin residents rely on a private water supply, usually a drilled well, for their drinking water. The three cases of infant methemoglobinemia due to nitrate contamination of private wells investigated by the DHFS and local health departments during the 1990s remind us that it takes vigilance on the part of the public health and primary care communities to encourage annual monitoring of private water supplies by homeowners.[5]

One significant issue the environmental health community is addressing is the natural occurrence of elevated arsenic levels in wells located in the Fox River Valley of northeastern Wisconsin. As many as 30,000 wells in this and other areas in Wisconsin are thought to contain arsenic in excess of the US Environmental Protection Agency's (EPA) proposed safe maximum contaminant level of 5 ppb.[6] Elevated arsenic in drinking water has been associated with lung, skin, and bladder cancer, dermatological problems, and diseases of the liver, blood vessels and other organs. While the public health community works to increase information and outreach efforts to these citizens, primary care physicians can encourage patients on private wells to inquire about an annual well test from their local public health department.

Radiation Safety – There are two initiatives of major significance to improve radiation safety in the coming decade. The Governor has petitioned the US Nuclear Regulatory Commission to allow the DHFS, Bureau of Environmental Health to assume regulatory responsibility for radioactive devices and materials within the state. This will have the effect of

clarifying regulations, improving emergency response capability and reducing licensing fees for Wisconsin's industrial, academic and health care institutions.

The second initiative deals with the manner that the state will address the US EPA's proposals to reduce the Maximum Contaminant Level (MCL) for the allowable concentration of radon in municipal drinking water supplies. Radon gas, the second leading cause of lung cancer after cigarette smoking, is naturally occurring at levels in excess of the proposed MCL in up to 30% of community drinking water wells in Wisconsin.[7] The inhalation of radon which is out-gassed to the air from household water use represents a smaller proportion of the total exposure as compared to radon entering indoor air through residential foundations. Therefore, rather than investing millions of dollars in control technology to remove radon gas from municipal water distribution systems, the DHFS and the Wisconsin DNR will investigate the more practical and cost effective approach of exposure reduction using soil depressurization systems in existing residences and radon safe construction for new homes as discussed in the article by Weiffenbach and Anderson on page 39. Again, the role of the physician should be to encourage residents to get information on household radon testing by calling the statewide information number 1-888-LOW-RADON.

Other old and emerging issues – While the efforts of governmental environmental health have resulted in significant improvements in basic sanitation and air and water quality, there remain many issues, both old and new, that we will be focusing on in the next decade.

- Already in the year 2000, we have seen five, very preventable, carbon monoxide fatalities in our state. Primary prevention efforts will have to include greater information and outreach efforts to encourage annual inspection of home heating and combustion sources along with the use of reliable CO detectors that are now widely and inexpensively available in hardware stores.
- Groundwater monitoring data tells us that we must be vigilant in our efforts to prevent chemical contamination of this important resource from agricultural and industrial practices and abandoned waste sites. More and more of our lakes and rivers are being added to the bodies of water characterized by fish consumption advisories. The concentrations of persistent organic contaminants such as polychlorinated biphenyl's, while generally decreasing, continue to remain elevated in some sport fish in the Fox River and the Great Lakes. Most additions to the fish consumption advisory are due to finding elevated levels of mercury in fish in our inland lakes. These levels are of a particular concern among pregnant mothers and frequent consumers of sport fish.
- Lessons from the train derailment in Weyauwega have demonstrated the need to sharpen emergency response capabilities to natural and man-made disasters as well as the emerging threat of acts of chemical and biological terrorism.

Although this litany of important issues could continue on, one of the biggest challenges to environmental health is to improve our capacity to track the occurrence of environmental and chronic disease in our state with the hope of improving our knowledge of disease causation and distribution. These efforts could yield a substantial body of data that could be used to focus information and prevention efforts and, over the long term, could increase the knowledge on the causes and risk factors associated with chronic disease.

Resource Directory Available on Web

A new Internet-based Wisconsin Environmental Health Resource Directory provides links to various environmental agencies and programs for information on specific topics from A-Z.

www.dhfs.state.wi.us/programs (click on "Environmental Health Resources")

For specific information about a toxic chemical, click on "Toxic Chemical Fact Sheets."

Where To Get Information

The landscape of governmental environmental health has changed substantially since the beginning of this century when the State Board of Health and larger local health departments struggled with the basics of environmental health, the sanitation issues. The 20th century was characterized by increasingly complex environmental health issues from substandard housing conditions, to occupational health and safety issues, to industrial waste handling practices that negatively impacted drinking water, surface water and air resources. A growing population led to more intense agricultural practices, widespread wildlife habitat destruction and intensive use of agricultural chemicals in our farming operations. The traditional regulatory approach of the public health system was no longer sufficient to deal with the complex and myriad environmental health issues. The federal level of government saw the creation of such agencies as the Occupational Safety and Health Administration (OSHA), the US Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR). At the state level, the original State Board of Health was reorganized in the 1960s to what is presently the Department of Health and Family Services. Much of the environmental regulatory responsibility over water, wastewater and air was placed in the Wisconsin Department of Natural Resources. Sig-

nificant responsibility in the areas of food safety, agricultural chemical management and consumer protection resides within the Department of Agriculture, Trade and Consumer Protection. The Wisconsin Department of Commerce administers housing and plumbing codes and on-site wastewater treatment (septic) codes.

The scenario is unfortunately as confusing at the community level. Here a myriad of 99 county and municipal health departments provide services at the local level. However, only 33 of these agencies have formal environmental health programs, staffing and capacity. How does a physician access information within this complex system? For starters, visit the DHFS website to view *The Environmental Health Resource Guide* (see sidebar) or call your local public health agency to receive a copy. This publication represents a comprehensive guide and locator of environmental health resources at the state and local level.

So what is the biggest challenge of the 21st century? Within this confusing governmental infrastructure, there is a great need to re-connect the complex institutions of environmental health, environmental protection, conservation and public health – to focus on those outcomes that will improve the quality of the environment and the public health of our communities. This will not require the creation of new organizations of government or the reorganization of existing agencies. And of course government can't do it alone. What will be required are increased cooperation, aligned missions and permanent interconnections, not only across government institutions but also in partnership with others in the public and private sectors such as the State Medical Society. It is this type of cooperation that will be necessary, not only to improve public perceptions of environmental health but, more importantly, to sustain and improve upon the progress made in environmental health during the last century.

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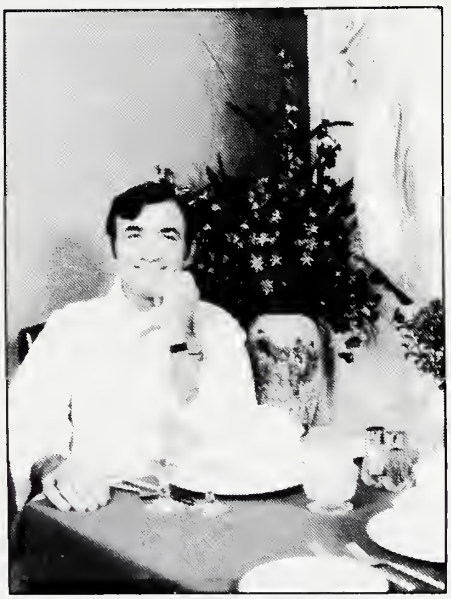

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Wisconsin Children at Risk for Lead Poisoning

Susan LaFlash, BSN; Margie Joosse-Coons, MSN; Jeffrey Havlena, MS; and Henry A. Anderson, MD

ABSTRACT

The 1999 US Government Accounting Agency (GAO) report to Congress documented that among children in the United States, those served by federal health care programs had high rates of lead poisoning but low rates of blood lead testing. To further explore these findings, the Wisconsin Department of Health and Family Services initiated matching the state's blood lead test data file with the Medicaid eligibility file, and with the WIC Program enrollment file. This article examines data analyzed from the matched files for the year 1999. The results of the analysis of Wisconsin data shadowed the national findings contained in the GAO report.

About half of the Wisconsin children enrolled in Medicaid and WIC have been screened, the majority of lead poisoned children in Wisconsin receive Medicaid (80%) and WIC (60%) services. Additional data collected by the department on the physical and environmental health of severely lead-poisoned children indicates that lead-coated surfaces and deterioration were identified as the primary source and cause of the poisoning. These findings support the Wisconsin recommendations for blood lead testing of 1 and 2 year olds living in older or renovated housing, and all children enrolled in Medicaid or WIC.

WISCONSIN CHILDREN AT RISK FOR LEAD POISONING

In 1999, the US General Accounting Office responded to a request by Representative Henry A. Waxman, of the US House of Representatives Committee on Government Reform to review federal activities for ensuring that at-risk children receive screening and treatment for lead poisoning. The resulting report was the first to look extensively at lead screening and treatment among children served by federal health care programs, specifically Medicaid, the Women, Infants, and Children Nutrition Program (WIC), and Federally Qualified Health Care centers (FQHCs).

The GAO report explored in detail the results of National Health and Nutrition Examination Survey III (NHANES III, Phase 2, October 1991 – September 1994)[i] related to blood lead testing. The outcomes verified what the Centers for Disease Control and Prevention (CDC) and state lead poisoning prevention programs had known: few children are being screened for lead poisoning, and those that are poisoned are more often the poor and un- or underinsured children. Despite mandatory screening for lead poisoning required by the Medicaid program and FQHCs, few children in these programs are being tested. (Figure 1)

The high incidence of lead poisoning among children enrolled in the federally-funded health care programs supports the mandatory or recommended testing of these children found in many federal and state program and statutes. The GAO report found that 77% of children with elevated blood lead levels (levels ≥10µg/dL) were enrolled in one or more of these programs.

LEAD SCREENING & POISONING AMONG WISCONSIN CHILDREN

Analysis of Wisconsin data indicated similar trends of screening and lead poisoning among 0-5 year olds as found in the GAO report.[ii] The overall positive screening rate (number of children with blood lead levels ≥10µg/dL/number of children screened) for the state is 6%, compared with 4% in the nation as noted in the GAO report. Yet despite rates of lead poisoning higher then the national average, only 16% of Wisconsin 0-5 year olds have been screened (Figure 2).

Further analysis of the data reveal that Wisconsin follows national trends of risk factors for lead poisoning: poverty (as evidenced by enrollment in Wisconsin Medicaid or WIC program), young age (1 -3 years), and residence in or exposure to buildings built before 1950. The Wisconsin Screening Guidelines for Blood Lead

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Testing support targeting of children with these risk factors for screening (Figure 3). The recommendations echo the Medicaid program requirement of screening all children ages 1 and 2 years, and those ages 3-5 years if they have never had a test. They further *recommend* an additional blood lead test at 18 months, and annual screening of Medicaid children at 3-5 years if they reside in the cities of Milwaukee or Racine where older housing and poverty justify a more aggressive screening program. (The Wisconsin Medicaid Program does not require a lead test at the older ages, but will pay for it if ordered by the physician). For children ages 3-5 residing in the rest of the state, blood lead tests should be done if the responses to the 4 Easy Questions indicate the presence of a risk factor. The 4 Easy Questions in the guidelines further focus on age of housing and the presence of paint disruption as predictive assessments of risk. A further discussion of the risk factors follows.

Children From Low-Income Families

The GAO report utilized data on children in federally-funded health care programs to examine lead poisoning and screening when income qualifies them for enrollment in these programs. As nationally, Wisconsin children in Medicaid and WIC have high rates of lead poisoning, but very low rates of screening. For children enrolled in these programs, screening and lead poisoning among 1 and 2 year olds was evaluated, in part to evaluate compliance with state and federal regulations. Among children who were classified as lead poisoned, 9% were enrolled in Medicaid and 7% in WIC (children can be enrolled in both programs). While children enrolled in Medicaid and WIC represent about half of the children screened (53% and 48% respectively), they comprise the majority of poisoned children (80% and 60%). Screening within each program, even when required as for Medicaid children, is steadily rising but remains low at 30% (Figure 2).

Children Ages 1 and 2 Years Old

The focus of federally-funded health care programs on testing of children ages 1 and 2 is based on research documenting characteristics that make them vulnerable to lead exposure and poisoning. First, the central nervous system of 1 and 2 year olds is evolving and the toxic effects of lead can have life-long effects on growth and development. Second, developmental activity at this age, such as crawling, walking, hand-to-mouth activity and exploring the environment, is more likely to expose them to lead dust on floors, toys, in windows.

While it is difficult to determine exactly how many Wisconsin children meet the recommendations for blood lead testing based on responses to the screening questions (except for Wisconsin Medicaid Children), in 1999 only 16% of Wisconsin 1 and 2 year olds were tested.

Figure 1. Selected Findings of the 1999 GAO Report on Lead poisoning Among US Children Ages 0-5 Years

	% Screened	% Poisoned
Children enrolled in Medicaid	19	>8
Children enrolled in WIC*	18	12
Children served by FQHCs*	17	6
All children surveyed	11	4
Children receiving no services from these programs	7	2

Source: "Lead Poisoning: Feceral Heatlh Care Programs Are Not Effectively Reaching At-Risk Children," A report to the Ranking Minority Member, Committee on Government Reform, House of Representatives, US General Accounting Office, January, 1999. Data from NHANES III, Phase 2 October 1991 – September 1994.
*WIC: Women, Infants & Children Nutrition Program; FQHC: Federally Qualified Health Center.

Figure 2. Lead Testing and Poisoning Among Wisconsin 1 and 2 Year Olds By Enrollment in Federally Funded Health Care Programs, 1999

	% Screened	% Poisoned
Children enrolled in Medicaid	30	9
Children enrolled in WIC*	35	7
All children surveyed	16	6
Children not in MA	14	3

Source: Matched Database of the Wisconsin Medicaid Program Eligibility File, the Wisconsin WIC Program Enrollment File, and the Wisconsin File of Reported Blood Lead Tests, 1999.
*WIC: Women, Infants & Children Nutrition Program

Lead-Based Paint in Old Housing

Lead-based paint (LBP) in old housing poses the biggest risk for lead poisoning to Wisconsin children. Lead was added to increase its durability and endurance until banned in 1978. The older the building the more likely it is to contain LBP; the older the paint the higher the lead content is likely to be. Studies indicate that structures built before 1950 are more likely to pose a lead hazard to children. Pre-1950 housing makes up 37% of Wisconsin housing stock. Because lead was not banned in residential paint until 1978, housing built before that period, especially if undergoing renovation, painting or remodeling, can also create lead hazards for children from the disruption of lead-based paint that may be present.

Data collected on reports made to WCLPPP on the health and environments of children with severely elevated BLLS ($\geq$20µg/dL) indicates that 86% of the homes or buildings where exposure took place were built before 1950. The primary source of exposure identified in 64% of cases was leaded surface coating. Accessibility of lead-based paint to the child also contributes to exposure. In 40% of cases the location of LBP was windows. Porches, although often forgotten as outside structures, are a common play area for children and were involved in 13% of cases. The cause of

Figure 3. Wisconsin Blood Lead Testing Schedules: Wisconsin Department of Health & Family Services, November 1997

Targeted Screening Policy
- Assess Risk Using the 4 Easy Questions
- Assess at each well-child visit ages 6 mos through 5 yrs
- Obtain a blood lead test when an answer indicates need
- Test all children on Medicaid at age 1 and 2 years

OR

Universal Screening Policy
- Each child receives blood lead test at age 1 and 2 yrs
- Each child age 3-5 yrs is tested if never done before
- If the child resides in the City of Milwaukee or Racine screen at ages 12, 18, and 24 months

↓↓↓

Blood Lead Test Drawn (capillary or venous)

↓↓↓

Result is:

BLL < 10 µg/dL:	Age 1	Retest at age 2
	Age 2	No further testing required
	Age 3-5	No further testing required (if on Medicaid & a city of Milwaukee orRacine resident, test annually through age 5)

BLL 10 µg/dL or Above:

BLL 10–19 µg/dL
- Obtain Diagnostic Venous Test Within 3 months
- Follow-up Venous Test Every 2–3 months
- Other lab tests: Assess iron status, treat if anemic

BLL 20–44 µg/dL
- Obtain Diagnostic Venous Test Within 1 week – 1 month (Urgency depends on BLL)
- Follow-up Venous Test Every 1–2 months
- Other lab tests: Assess iron status, treat if anemic; Serial Erythrocyte Protoporphyrin (EP) Levels

BLL 45–69 µg/dL
- Obtain Diagnostic Venous Test Within 24-48 hours
- Follow-up Venous Test 10-14 days post chelation; weekly for 6-8 weeks; monthly for 4-6 months; every 1-2 months
- Other lab tests as needed for chelation therapy

↓↓↓

When the following criteria are met, testing can be done about every 3 months to 36 months of age, then as needed:
- The BLL is <15µg/dL for 6 months
- Lead hazards have been removed
- There is no new exposure

the LBP becoming a hazard was noted to be deterioration in 82% of cases, and some form of renovation in 22%. (Figure 4)

There are other potential sources of lead hazards in the home, including imported vinyl window blinds, ceramic tableware and pottery, and traditional remedies or cosmetics. Adults who live in a home and have hobbies such as making stained glass, pottery or leaded fishing sinkers can contaminate the home or the child directly by having contact with them when clothing or hands are contaminated. Family members who work in leaded environments and who are not able to shower and change clothes before returning home can expose children from that source and from contaminating their car while commuting to work. Water sources of lead have not been found to be significant in Wisconsin. Concern about a possible lead source in the plumbing system can be addressed by running cold tap water until icy before using for drinking or cooking, and mixing formula with bottled water instead of tap water.

THE EFFECTS OF LEAD ON CHILDREN AND THE COMMUNITY

There are significant costs children and their families pay when lead poisoning occurs. Loss of growth, learning, potential and income are all real for lead poisoned children. Loss of housing, procuring resources for the child and home, and possible long-term dependence of the child are all challenges for the family.

Studies have persistently shown a correlation between low-level lead exposure during early development and deficits in neurobehavioral-cognitive performance that manifest later in childhood.[3,9,10] Animal research on the effects of lead on brain structure and function demonstrate multiple cellular and synaptic disruptions caused by lead. Current studies looking to identify a threshold of lead below which effects do not occur have been unsuccessful.[2,8,9] The effects demonstrated in several longitudinal studies have been persistent across cultures, racial/ethnic groups, and social/economic class.[1,4]

Societal costs of lead poisoning include increases in poor school performance, behavior disorders and antisocial behavior among lead poisoned children. Difficulties achieving in school can lead to classroom disruption, increased costs for special education, and decreased potential of the effected child. In 3 major prospective studies, a persistent inverse relationship was found between IQ and blood lead level up to 10 years of age, and/or school performance.[1,4,9]

Behavior changes noted among children with lead poisoning range from hyperactivity, distractibility and low tolerance for frustration, increased fearfulness, social withdrawal, increased aggression, and higher involvement in crime and unwed pregnancy. A history of elevated lead levels has been found among juveniles and adults incarcerated in the nation's prison system.[5,6,7] The compounding effect of school failure and social disruption is a cost of lead poisoning a community must weigh against investment in prevention and adequate housing.

DETECTING AND MANAGING LEAD POISONING IN CLINICAL PRACTICE

Primary health care physicians can prevent lead poisoning through early assessment and education of the family. Physicians can work closely with local public health departments to become familiar with community specific risk factors (industry, location of old housing, and cultural differences) and to refer patients for public health services. Because venous blood lead tests are the preferred sample type for diagnosis and follow-up of lead poisoning, physicians have primary responsibility

in providing these tests and in monitoring the child over time for the possible effects of lead poisoning on growth, development, learning and school performance.

There is a common belief that if a child is tested at age 1 and is normal, there is no need for further screening or testing. This belief is reflected in screening data, which show many more children tested at age 1 year than any other age. Yet in Wisconsin the rates of lead poisoning are higher among 2 and 3 year olds than 1 year olds, even when they have had a previous negative test (Figure 5). For pediatric physicians and health care providers, the data demonstrate the persistent risk of lead poisoning for children ages 1, 2 and 3 years, even if a routine blood lead test at a younger age was normal. It supports the continued assessment of all children for risks of exposure and testing when risk factors are present.

To incorporate lead screening into clinical practice, the following can be done:

- Establish steps to identify if a child is enrolled in Medicaid when seen for services, and test them at the required ages.
- Establish a protocol that assures the screening questions related to housing are asked by clinic staff during intake for well-child visits to determine the presence of risk factors.
- If risk factor(s) are identified, order a blood lead test at the appropriate ages, according to the Wisconsin Screening Recommendations.
- Provide information to all families of young children about lead hazards, and how children can become exposed (copies of sample brochures can be obtained from WCLPPP, 608-266-5817).
- If a screening test result is ≥10µg/dL, order a venous diagnostic test (Figure 5).
- If a child is diagnosed with lead poisoning, refer the family to the local health department and provide the child with regular follow-up blood lead tests and monitoring. (Figure5).

Children seen at WIC clinics often have characteristics associated with lead exposure, and WIC programs target many of the children who are at high risk, including 1 and 2 year olds and children from low-income families. Screening is not required for participation in WIC programs. However, many Wisconsin WIC programs work closely with their local health departments and/or Health Maintenance Organizations (HMOs) to screen children as they receive WIC services, including capillary blood draws to evaluate iron levels. This collaboration can benefit young children and the families greatly by providing a source for lead testing and nutritional evaluation and support services.

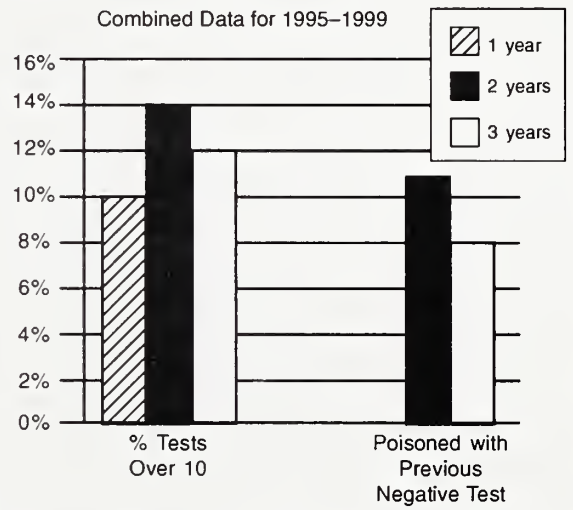
Lead poisoning is a disease that most often does not reconcile quickly but persists as the child grows older. Additional analysis of composite statewide blood lead level data for 199 –1999 show that while the onset of lead poisoning may be acute or chronic, the recovery is prolonged. The median rate of increase of BLLs is 9.4µg/dL per year. However an EBL declines at a slower rate, of about 7µg/dL per year. This means it will take a typical child more than 2 years to recover from lead poisoning. Monitoring with timely follow-up blood lead tests and assessment for re-exposure and normal growth and development is important in the clinical management of lead poisoned children.

Figure 4. Identified Sources of Lead Exposure for Lead Poisoned Children in Wisconsin, 1999

Causes of Lead-Based Paint Hazards	
Deterioration	82%
Remodeling	11%
Scraping/sanding paint	11%
Mouthing/chewing surfaces	10%
(Investigations with causes reported = 62)	
Location of Lead-Based Paint Causing Exposure	
Windows	40%
Doors	13%
Trim/woodwork	14%
Porches	13%
Walls/ceilings	11%
Floors/stairs	4%
(Investigations with locations reported = 62)	

Source: Environmental Investigation of a Lead Poisoned Child Reporting Forms, Wisconsin Department of Health and Family Services, 1999

Figure 5. Proportion of Blood Lead Tests >10 µg/dL by Age of Child



Source: Wisconsin File on Reported Blood Lead Levels, 1995–1999

WISCONSIN INITIATIVES AGAINST LEAD POISONING

Since 1992, the State of Wisconsin has provided funding for local health departments for screening and treatment of lead poisoned children and for community

education efforts. The Department of Health and Family Services is also the recipient of numerous federal grants from the Center for Disease Control and Prevention, the Environmental Protection Agency, and the US Department of Housing and Urban Development. These funds are used to support public health lead poisoning prevention programs in high-risk areas, certification and licensing of lead professions, research, and aid for lead hazard reduction.

Wisconsin has required reporting of blood lead levels to the Department of Health & Family Services (DHFS) since 1994. In 2000, rules became effective that specified the types of information that is required and the responsible reporting parties. These rules will enable DHFS to better fulfill its surveillance role of the incidence of the disease and strategies for targeting prevention activities.

In 1999, the Wisconsin Supreme Court ruled that a property owner should be knowledgeable of lead hazards in rental units, and is liable for damages if a child is found to be lead poisoned. This year, the Wisconsin legislature passed Act 113 in an attempt to provide incentive for owners to obtain certification of "lead-safe" or "lead-free" status of their properties by providing limited liability protection for that status. Rules are currently under development to define the implementation and monitoring of this law.

The Wisconsin Medicaid Program includes the federal requirement for blood lead testing of 1 and 2 year olds in contracts with HMOs to provide health care to children enrolled in the Medicaid program. The HMOs are required to do the necessary outreach to connect children in Medicaid/BadgerCare with a primary care provider or public health clinic in order to obtain a lead screen. Lead screening is also a Targeted Performance Improvement Measure, which requires HMOs to report the lead screening rates for their clients at ages one and two years. The Wisconsin Medicaid Program reimburses local public health departments for providing follow-up services to children with severe lead poisoning, including a nursing education/assessment visit to the home, and environmental investigation of the child's home and a follow-up to assure that ordered lead hazard reduction activities were accomplished safely.

A LEAD-SAFE FUTURE FOR WISCONSIN CHILDREN

Further work in aggressively identifying children who face lead exposures, early detection of lead poisoning, prompt treatment and follow-up, and adequate funding of lead hazard reduction activities are all important in protecting Wisconsin children from lead poisoning. Physicians are key to implementing these actions and can be forceful advocates in promoting community awareness and intervention to eliminate lead hazards.

APPENDIX

i. The NHANES surveys measure the health and nutritional status of the civilian non-institutionalized U.S. population ages 2 months and older. Blood lead levels are included as part of the physical examination provided with the survey and have contributed to the national surveillance of lead exposure in the United States.

ii At this time the WCLPPP has not analyzed data on the population of Wisconsin children served by the Federally Qualified Health Care Centers in Wisconsin

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Childhood Exposure to Lead in the Environment: A Case Study

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INTRODUCTION

The majority of children in Wisconsin are lead poisoned as a result of dust from deteriorating lead-based paint in their homes or daycare sites. Over the past several years another, sometimes overlooked source of lead has been identified, i.e., lead-based varnish. This article reviews one case of childhood lead poisoning that was related to this unusual source of exposure.

In 1999, there were 104,746 Wisconsin children enrolled in Women, Infants and Children Nutrition Program (WIC). Of those children, 56% (58,609) had had at least 1 blood lead test reported, inclusive of tests performed prior to 1999. These tests were not all performed at WIC. They may have been done by the child's primary health care provider. Of those children tested, 17% (9598) had blood lead levels ≥10mg/dL.

CASE STUDY: DODGE COUNTY

At 3½ years old, a boy in Dodge County got his first blood lead test at a routine visit to the Women, Infants and Children (WIC) Clinic. The child was tested because his mother answered "yes" to the screening question, "Do you live in a house built before 1950?" His capillary blood lead level was 62 mg/dL. The child was then referred to his physician, who confirmed a venous blood lead level of 58 mg/dL. Additional testing detected an erythrocyte protoporphyrin (EP) level of 1452 µg/dL (normal <35 µg/dL) and hemoglobin of 7 g/dL (normal 11-13 g/dL). The child was then started on an iron supplement.

A referral was also made to the Dodge County Health Department. The public health nurse, who was also a certified lead risk hazard assessor, conducted the initial nursing assessment and lead investigation at the child's home. She found the child had severe pica, which was evidenced by his chewing of numerous varnished surfaces in the home for the previous 1.5 years. The nurse identified the imminent lead hazards as those surfaces he had chewed on, which included the dining room furniture and a majority of the interior window surfaces. The lead content in the varnish of the window trim was found to be .09% lead by weight. (WI Statute 254.11 defines lead-bearing paint as "any paint or other surface coating material containing more than 0.06% lead by weight.") Other lead hazards included chipping and peeling paint on the exterior windows and garage. The nurse recommended immediate removal of the dining room furniture and thorough cleaning of the window surfaces until longer-term lead hazard reduction measures could be completed. The family immediately followed her initial recommendations.

Soon after iron therapy was started, the child's pica behavior stopped. With the imminent lead hazards initially controlled and the pica behavior no longer presenting a risk for ongoing exposure, the child received his first course of chelation medication to reduce his blood lead level. Within a few weeks of the first chelation treatment, his blood lead level rebounded to 47µg/dL. After consulting with the physician, the public health nurse returned to the home before the second course of chelation treatment was started. She found the deteriorated paint on the exterior of the house and garage had not yet been adequately addressed. A search was undertaken to find temporary lead-safe housing for the family. They moved in with a friend who lived in a newer apartment building and the child began his second chelation treatment.

With the family temporarily relocated, lead hazard reduction work could be conducted in the home without placing the child at risk for further exposure. The local housing office was contacted to determine the availablility of financial resources to assist the property owner with the cost of the lead hazard reduction work. After finding she was eligible for community block grant funds which are targeted to property owners on limited incomes, she was able to hire a certified lead

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contractor to conduct lead abatement work. After several months, the public health nurse conducted a follow-up lead investigation and, upon determining the work had been satisfactorily completed, allowed the family to return to a lead-safe home.

The public health nurse continued to provide ongoing case management services to this child and his family for several more years. During that time she worked closely with the child's physician, the local housing agency, and the Wisconsin Childhood Lead Poisoning Prevention Program (WCLPPP) staff. Three years after his initial diagnosis of lead poisoning, the boy's blood lead finally decreased to a safe level of 5 ug/dL. The nurse said, "The time, energy and willingness to keep in touch with this family, and the efforts to secure lead-safe housing for them were well worth the effort."

DISCUSSION

This case demonstrates several important factors in identifying and treating lead poisoned children:

- The importance of using Wisconsin's blood lead screening guidelines to determine if a child should be tested for lead poisoning. These screening guidelines are described in detail in the accompanying article, entitled "Wisconsin Children At Risk for Lead Poisoning" on page 18.
- An elevation in erythrocyte protoporphyrin (EP) indicates impairment in the biosynthesis of heme, which can result from lead exposure. A severe elevation, as in this case, can indicate chronic lead exposure. The blood lead level of a child found to have long-term lead exposure may not return to a "safe" level, i.e., <10 mg/dL, for several years due to the amount of lead that may be stored in the bones. When paired with blood lead values, EP can be used to evaluate the effectiveness of treatment measures.
- When a lead poisoned child is identified, a comprehensive lead hazard investigation should be completed. It's important to consider all potential sources of lead exposure for each child. In this case, lead-based varnish was one of the primary sources of exposure.
- Chelation medications enhance the excretion of lead from the body. It is imperative, however, that a child who is undergoing chelation treatment reside in a lead-safe home. The source of lead exposure should be identified and corrective measures taken prior to initiating treatment.
- Financial resources to correct lead-based paint hazards are available to low or moderate income property owners in some communities. These resources should be utilized whenever possible.

CONCLUSIONS

The single most important factor in managing childhood lead poisoning is reducing the child's exposure to lead. It is imperative that a lead poisoned child's home be thoroughly investigated for lead hazards and all necessary corrective actions taken in order to interrupt the cycle of exposure. While the most typical source of lead exposure for Wisconsin children is lead-based paint, other products commonly used in the past, such as varnish, may contain lead. All possible sources of exposure should be considered for each lead poisoned child.

COMMENT

This case study does not fully represent how complicated this case is. The WCLPPP recognizes the thoroughness with which the Dodge County Health Department provided follow-up childhood lead poisoning interventions. Much time and effort can be needed when coordinating care for a child with an elevated blood lead level.

ACKNOWLEDGEMENT

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Occupational and Adult Lead Exposure in Wisconsin

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ABSTRACT

Lead is a versatile metal with many industrial applications. It is among the oldest recognized occupational health hazards. Lead poisoning has been a reportable disease in Wisconsin since 1911. Although reportable, it was not until Wisconsin established an Occupational and Environmental Health Epidemiology program in 1979 that modern reporting levels were adopted, physician and laboratory reporting promoted and publicized, and elevated blood lead report tracking initiated. With the federal funding from the National Institute of Occupational Safety and Health (NIOSH), a comprehensive adult blood lead surveillance program was created in 1987. Eleven years of surveillance trend data reveal a Wisconsin success story. Most Wisconsin industries have made substantial strides toward reducing occupational lead exposure. The improvement is reflected in the reduced number of elevated blood lead levels in Wisconsin's adult blood lead surveillance data. However, Wisconsin must remain vigilant as new and re-emerging lead exposures continue to be identified through adult blood lead surveillance. Wisconsin will also need to continue with its occupational lead exposure reduction efforts if it is to achieve the Federal Healthy People 2010 goals and objectives to have no adult blood lead level greater than 25µg/dL.

INTRODUCTION

Although some improvement has been seen, the impact of work-related illnesses and injuries in the United States remains significant. According to the National Safety Council (NSC), in the United States, 14 people are killed and 10,400 are disabled at work on an average day. Work-related diseases cause as many as 60,000 deaths per year. The NSC estimates that there were approximately 5,923,000 workplace nonfatal injuries and illnesses from 1992 to 1998 in the United States and the cost of workplace unintentional injuries alone in 1999 was $127.7 billion.[1] In a 1993 *Wisconsin Medical Journal* article, it was estimated that of the 120,000 employers in the state, 4703 (4%) were using lead, and between 56,000 and 114,000 workers were exposed to lead at work.[2]

Wisconsin has made progress toward the Public Health Agenda 2000 goal "no workers will have blood lead level determinations greater than or equal to 50µg/dL and no pregnant working women will have blood lead levels greater than 25µg/dL."[3] The goal, however, has not been achieved and renewed effort is needed.

The *Healthy People 2010* initiative, published by the US Department of Health and Human Services in January 2000, expands upon the Federal Year 2000 occupational safety and health goals and objectives. One 2010 objective is to reduce the number of persons who have elevated blood lead concentrations from work exposures. The 2010 target for this objective is total elimination of occupationally related lead poisoning, defined as an adult having a blood lead result of over 25µg/dL.[4] According to the *Healthy People 2010* initiative, men and women who are planning to have children should have lead levels below 25µg/dL to decrease risks of infertility problems, miscarriage and fetal development problems.[4] This recommendation is in contrast to the current occupational lead standard that only requires action when blood lead values exceed 40µg/dL.

Current Occupational Lead Exposure Standards Applicable to Wisconsin

When the federal Occupational Safety and Health Administration (OSHA) was established, Wisconsin chose to have its private industry regulated by the federal program rather than establish a state plan. Thus, private industry is inspected by OSHA and must comply with the OSHA workplace standards.

OSHA has two separate standards that address occupational lead exposures. The first is the OSHA Lead Standard for General Industry (29 CFR 1910.1025). This standard addresses all work involving lead for general industry, but excludes work involving agriculture and any work that would be covered in the OSHA Lead Standard for Construction.[5] The second standard is the OSHA Lead Standard for Construction (29 CFR 1926.62). This standard defines construction

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work as any work involving alteration and/or repair, including painting or redecorating, where an employee might be exposed to lead.[6] For each standard, medical surveillance, engineering controls, work practice controls, use of protective work clothing and equipment, administrative controls, respirator use, air monitoring, employee notification and employee training are all triggered by air lead levels tested at the worksite. The types of actions taken by a company will depend upon the level detected during air monitoring for lead.

OSHA Required Medical Surveillance

For adults, venous blood lead levels with a zinc protoporphyrin (ZPP) are drawn to determine their level of lead exposure. For an employee with a blood lead result of 40µg/dL to 49µg/dL, repeat blood tests every 2 months until two consecutive blood lead level (BLL) tests are less than 40µg/dL are required. For an employee with a BLL greater than or equal to 50µg/dL, the employee must be removed from lead exposure. This removal should consist of placing the employee into a job within the company that has no exposure to lead. The employee can return from work removal when two consecutive BLL tests are less than or equal to 40µg/dL.[5] Employees exposed to lead need medical evaluations performed annually and as deemed appropriate when blood lead levels have been greater than or equal to 40µg/dL at any time during the preceding year.

Occupational Lead Exposure and Poisoning Surveillance in Wisconsin

In 1911 lead poisoning was among the first non-infectious diseases made reportable in Wisconsin. In 1979 Wisconsin Statute 151 was created to place all lead-related activities in a single statute and made mandatory reporting of all adult blood lead values 60µg/dL or greater. In 1987, the reporting level was lowered to 25µg/dL, and in the 1993 revision of the public health statutes all blood lead test results became reportable. All health care providers are responsible for reporting blood lead levels and utilizing a laboratory that agrees to send their laboratory reports to the state. However, if the provider includes the necessary information on the laboratory slip, the laboratory reporting fulfills the health care provider's responsibility.

The Adult Blood Lead Epidemiology and Surveillance (ABLES) Program

In 1987 Wisconsin applied to the National Institute for Occupational Safety and Health (NIOSH) for funding to systematically track the adult lead poisoning reports received as well as track other occupational diseases as part of the NIOSH Sentinel Event Notification System for Occupational Risks (SENSOR) initiative.[7] After establishing SENSOR, NIOSH separately funded an Adult Blood Lead Epidemiology and Surveillance Program (ABLES). Wisconsin continues to receive NIOSH ABLES funding. The Wisconsin ABLES program is located within the Wisconsin Department of Health and Family Services (DHFS), Division of Public Health (DPH), Bureau of Occupational Health (BOH). The program receives statutorily required laboratory reports of blood lead testing of adult Wisconsin residents aged 16 and older. The ABLES program:

1. Maintains a database of reported laboratory lead results;
2. Investigates the circumstances associated with adult blood lead levels greater than 40µg/dL and provides educational materials regarding lead exposure to all adults with blood lead levels of 25µg/dL or greater;
3. Determines employer awareness of lead hazards and regulatory requirements;
4. Provides education about the health effects of lead and regulatory requirements to employers, employees and the general public and;
5. Refers employers needing technical assistance to the Wisconsin OSHA Consultation Program.

Wisconsin OSHA Consultation Program

OSHA Consultation, a state- and federally-funded program, is located in the BOH. At the request of an employer, it provides free on-site consultation and services (such as air sampling) to employers of less than 250 employees per site (500 corporate-wide) in the private sector to assist them in providing their employees with a place of employment that is safe and healthful. Because OSHA Consultation is totally voluntary, the company needs to call and invite the consultants to their facility to assist them with any problem they may be experiencing. OSHA Consultation is a separate entity from federal OSHA Enforcement, so the program does not issue citations and it does not share company information with OSHA Enforcement. The only obligation an employer requesting assistance has is a commitment to take necessary corrective actions in situations of circumstance of imminent danger for an employee or conditions where a serious hazard is found. This program has been an asset for small to medium sized companies which work with lead, but may not have known about their OSHA regulation requirements or may have had an employee with an elevated blood lead level, that did not know what to do to reduce their BBL. Many of these companies cannot afford to have private consultants come to their worksite to do air sampling, to monitor hygiene practices of workers, or to provide information about equipment or policies needed for the jobs performed.

CASE REPORTS OF RECENT ADULT LEAD POISONING REPORTS

Case 1: A construction worker became ill while performing his duties of renovating and remodeling a

turn-of-the-century building. He had been working at the site for approximately 2 weeks. The employee had symptoms of nausea, dizziness, headaches, fatigue, sleep disturbances, irritability and loss of appetite. He visited his family physician and mentioned that he had read some information about lead poisoning and was wondering if he might be lead poisoned. The worker's employer had never provided blood lead testing for this employee. The physician performed a blood lead test that found the venous BLL to be over 70µg/dL. The physician, familiar with the ABLES program, made a direct referral to report the elevated BLL. The laboratory also forwarded the report.

Case 2: A homeowner decided to remove the old paint from his 1950s home in preparation for repainting. After several days removing the paint with a heat gun and scraping, he began experiencing symptoms of headache, dizziness, memory problems, irritability, fatigue, nausea and loss of appetite. His wife was sufficiently concerned that she suggested he see his family physician; she had read about lead poisoning and wanted to make sure that this was not the cause of his symptoms and to be sure his BLL was not elevated. His blood lead test revealed a venous BLL over 50µg/dL. The physician made a referral to the local public health department. The staff at the local public health department as well as the testing laboratory reported the case to the ABLES program.

Case 3: A self-employed business owner of a stained glass repair shop visited his family physician reporting sudden numbness and tingling of his right arm, headache, sleep disturbances, muscle/joint aches and fatigue. During the visit it was noted that he had an elevated blood pressure and anemia. His BLL was drawn and revealed a level over 50µg/dL. The physician made a referral to the local public health department, which in turn reported to the ABLES program requesting assistance. The employer was referred to OSHA Consultation for an onsite visit for lead sampling and technical assistance.

Case 4: A carpenter went to see his family physician in regard to sudden right arm numbness and severe weakness and left arm numbness. He stated he did not work with lead at work, did not have any hobbies that involved lead and was not renovating or working with old paint at home or elsewhere. Despite his denial of lead exposure, a BLL was drawn and revealed a level over 50µg/dL. The physician referred the case to the local health department to determine the source of the lead exposure. The local public health department reported the case to the ABLES program. Careful investigation revealed that the lead exposure and subsequent home contamination had occurred while the patient had been drilling lead weights while making downriggers in his garage to use for his fishing business.

Figure 1. Number of Adult Blood Lead Tests Reported for Wisconsin Residents, 1989–1999

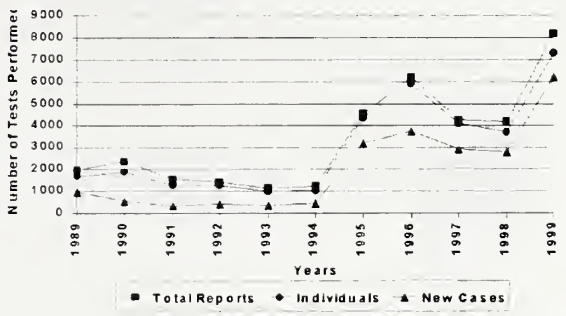
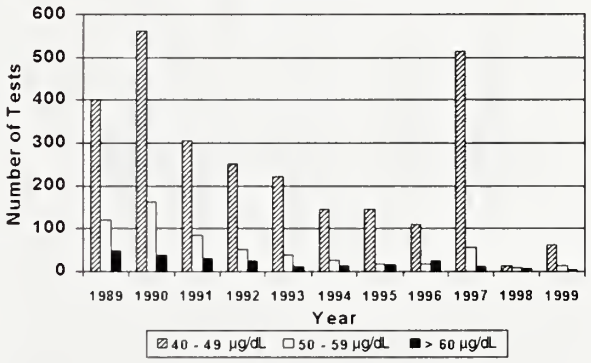


Figure 2. Blood Lead Test Results for Adult Wisconsin Residents 1989–1999

(Measured in Micrograms per Deciliter)



Note: In 1997 there were structural artifacts related to data entry. Blood tests are counted when they are typed into the data base, not the date they were drawn.

METHODS

For the past 11 years, the ABLES program has performed blood lead surveillance for Wisconsin residents aged 16 and older. The ability to track the numbers of screened individuals and their blood lead levels over time has been extremely valuable, not only for monitoring advancement toward the Year 2000 goals and the new 2010 goals, but also for early identification of emerging industries and exposures needing technical assistance and education. Figures 1 through 4 summarize the data collected over these years.

RESULTS

Figure 1 shows the total number of reports, the number of individuals and number of new cases made for each year. Total numbers of reports include all reports entered into the database for that year. An individual is defined as someone who had a blood lead test performed during the year. That person would only be counted once during the year, even if he/she had several BLLs performed. A new case is defined as someone

Figure 3. Frequency of Wisconsin Blood Lead Tests by Industrial SIC Code 1/1992 to 11/1999

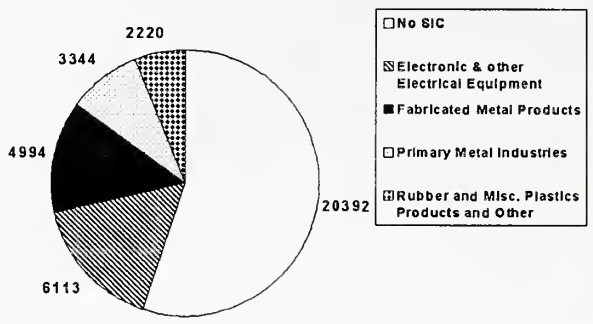
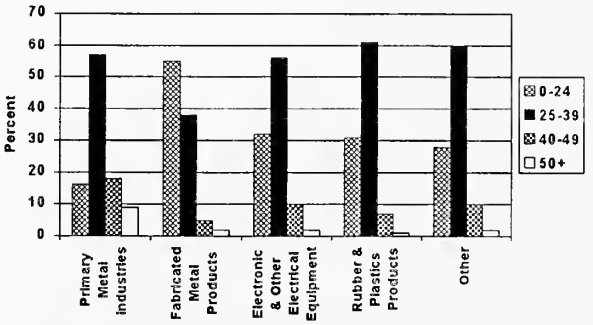


Figure 4. Distribution of Adult Blood Lead Levels Within Employer SIC Codes 1/1992 to 11/1999



who had not had a blood lead test in the previous 2 years. The importance of the level of blood lead that triggers reporting can be seen in the increased reporting in 1995 and 1996 as the 1993 reporting revisions were implemented. The explanation for the marked increase in reporting between 1998 and 1999 is being investigated.

Figure 2 shows the number of BLLs of 40µg/dL and greater reported each year from 1989 through 1999. With the exception of 1997, which saw a marked increase in the number of tests in the 40-49µg/dL range, there is an obvious decreasing trend in the number of reports over 40µg/dL.

Figure 3 shows the types of industries that have had the largest number of BLLs performed for their Wisconsin employees. In the past, occupational exposure to lead was primarily seen in businesses such as foundries, battery manufacturers and radiator repair shops. While they still account for a large number of the tests performed, electronic industries now account for the Standard Industrial Code (SIC) (individual codes that are assigned to all industries) having the largest number of BLLs performed for their Wisconsin employees. The majority of electronic industries use lead solder to make computer chips used in a wide variety of products. It should be noted that employer name is not always indicated on blood lead laboratory reporting forms.

While personal interviews with employees with BLLs over 40µg/dL will reveal the employer and type of work performed, the employers for BLLs under 40µg/dL may not always be known. As seen in Figure 3, 55% of adult blood lead reports in the data file do not have sufficient information to categorize the industry in which the individual worked.

Figure 4 shows the distribution of blood lead levels by employer SIC for the reports which had information or who had been interviewed by the ABLES staff. Although primary metal industries include the third largest number of coded blood lead tests (Figure 3), they had the highest percentage of reports over 40µg/dL.

DISCUSSION

Adult lead exposure and lead poisoning still occurs in Wisconsin and can have serious health consequences. The surveillance data supports the conclusion that most, but not all of Wisconsin's traditional lead using industries have reduced lead use and instituted better exposure controls in their facilities. However, especially in new emerging industries and construction/renovation businesses, workers may not recognize lead exposure and not know they have been lead poisoned, especially if the symptoms are mild and they do not seek medical attention. They may consider that the symptoms are due to a cold, stress or "getting old." Such individuals who are not aware that they have been exposed to a lead hazard (as in case study 4) cannot volunteer such information to their health care provider. Occupational and environmental exposure histories can be crucial physician tools when investigating the cause of such non-specific symptoms and can trigger prompt diagnostic testing, preventive action and treatment.[8]

Ironically, as efforts increase to control childhood lead exposures in the home, the lead abatement industry has responded with rapid growth. Many abatement industry workers are young and inexperienced. Unless the employer provides a greater emphasis upon worker protection, education and training, the potential exists for more workers to experience unacceptable lead exposure in circumstances such as those described in our exposure examples. Expanded educational efforts are also needed to reach homeowners who are doing their own home renovation and may not be aware of the potential health hazards associated with lead or the proper methods of removing lead. Health care provider consideration and evaluation of occupational, environmental and hobby-related lead exposure for adults is essential.

The ABLES program director as well as the OSHA consultation program staff are available to answer questions regarding lead exposure, to provide educational materials for physicians and other health profes-

sionals as well as to answer questions from employees and employers about lead and lead exposure. Physicians wanting more information regarding adult blood lead poisoning or to make patient referrals may contact the Wisconsin Adult Blood Lead Epidemiology and Surveillance (ABLES) Program at 608.267.3256 or e-mail message garmasj@dhfs.state.wi.us. Companies requesting on-site OSHA Consultation services can call 608.266.0417 for more information.

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Hazardous Ammonia Releases in Wisconsin: Trends and Risk Factors for Evacuation and Injury

Marc G. Weisskopf, PhD; James M. Drew, BS; Lawrence P. Hanrahan, PhD; and Henry A. Anderson, MD

ABSTRACT

Objective: To assess trends in hazardous ammonia releases and risk factors for subsequent evacuation and injury.

Methods: Analysis of the Wisconsin Hazardous Substances Emergency Events Surveillance system data during 1993 through 1998.

Results: Ammonia releases (291) accounted for 13% of all reported chemical releases, but 26% of all releases that led to evacuations. The majority of non-transportation-related ammonia releases are the result of equipment failure or operator error (85.5%). Few ammonia releases are transportation-related (6.5%) or occur during extreme weather (14.4%). Extreme weather is not a risk factor for evacuation or injury following ammonia releases.

Conclusions: Ammonia releases are frequently the result of equipment failure or operator error and thus preventable. The majority of ammonia releases that lead to evacuation and injury are not the result of transportation accidents or weather factors beyond human control. Prevention efforts that focus on preventive maintenance, and worker training and awareness could reduce the burden of hazardous ammonia releases.

INTRODUCTION

Ammonia may be best known as a household cleaner, however, it is also used extensively in the commercial sector. For example, the food processing industry uses ammonia as a chemical coolant for refrigeration, and in agriculture ammonia is used as an additive to fertilizer. Over 17 million pounds of ammonia were reported to Wisconsin Emergency Management as being present in Wisconsin in 1999. This extensive use of ammonia leads to widespread possibility of accidental release and exposure to toxic concentrations. In fact, ammonia is one of the most commonly spilled chemicals in Wisconsin and other states. A previous study that used data from nine other states documented that the risk of evacuation and injury following these spills is greater than for other chemicals.[1] Exposure to gaseous or liquid ammonia can cause severe burns and permanent damage to the lungs and eyes.

In order to help achieve the Wisconsin year 2000 goal of minimizing emergency events that lead to toxic chemical exposure,[2] the Agency for Toxic Substances and Disease Registry supports the maintenance of a Hazardous Substances Emergency Events Surveillance (HSEES) system in Wisconsin, as well as in 15 other states. This surveillance system monitors releases of hazardous substances throughout Wisconsin. Some of these can be severe; they receive extensive media coverage. For example, a 1992 train derailment in Douglas County, Wisconsin caused a release of aromatic distillates, which led to 103 injuries and the evacuation of more than 20,000 persons. Such media attention tends to lead to a conventional wisdom that these releases, and subsequent evacuation and injury, are usually the result of large-scale releases during transportation or extreme weather conditions beyond human control. However, many events receive less media attention, yet nationally, an estimated 15% of uncontrolled hazardous substance release events still result in evacuations, morbidity and mortality.[3]

Is the conventional wisdom true, or are other factors that may be preventable responsible for ammonia releases and their consequences? Given the morbidity and financial costs of such consequences it is important to understand the trends and risk factors for ammonia spills and resulting injury and evacuation. Such understanding can help to better target prevention messages and identify high-risk circumstances associated with such events. To determine these trends and risk factors we analyzed data from the Wisconsin HSEES for 1993 through 1998.

METHODS

The Wisconsin HSEES manager is responsible for actively investigating and gathering relevant information concerning any hazardous substance emergency event in Wisconsin and recording these data with a

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Figure 1. Hazardous substance releases reported to HSEES, Wisconsin, 1993–1998

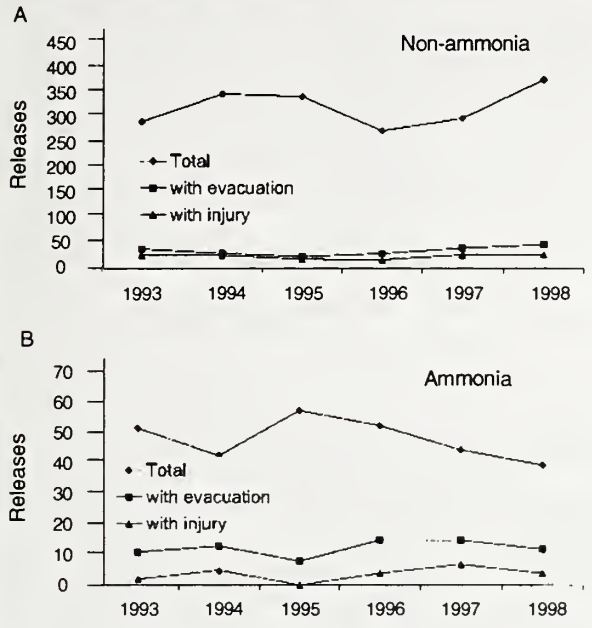

Table 1: Characteristics of uncontrolled ammonia releases in Wisconsin, 1993-1998.

Characteristic	N (%*)
Total releases	291
Evacuation occurred	74 (27.0)
Injury occurred	22 (7.6)
Food processing/manufacturing industry	205 (70.4)
Agriculture industry	31 (10.7)
Transportation related	19 (6.5)
In summer	170 (58.4)
During day	164 (63.3)
On weekday	237 (81.4)
In commercial area	200 (70.2)
In residential area	169 (59.3)
Not in residential or commercial area	59 (20.7)
During extreme weather	41 (14.4)
> 100 pounds	87 (36.4)
Result of equipment failure or operator error**	130 (85.5)

* Not all percentages were calculated sing 291 as the total because of missing information.
** Of 152 fixed-facility events only: This data was not collected for transport-related events or the remaining fixed-facility events.

software program that is used throughout the states that implement HSEES. Sources of information include records of state environmental, agricultural and emergency agencies, local fire and police departments, as well as the National Response Center and the Hazardous Materials Information System of the US Department of Transportation.

We considered all events reported to HSEES in Wisconsin during 1993 through 1998, except 10 events that involved a combination of ammonia and other chemicals. These were excluded because we could not be certain whether any resulting evacuation or injury was the result of the ammonia. These 10 events included 2 that led to evacuation and 2 that led to injury. Hazardous substance emergency events are defined as uncontrolled or illegal releases or threatened releases of substances or their hazardous by-products. Reportable substances are any that might reasonably be expected to cause adverse human health effects, which include, among others, ammonia, all pesticides, chlorine, sodium hydroxide, and hydrochloric, nitric, phosphoric, acrylic, and hydrofluoric acids. Petroleum releases, however, are specifically excluded. Reportable releases are all those in which an actual release occurs and those where there is only the threat of a release but some action is taken as a result, such as evacuating persons from the area. Releases are defined as transportation-related when they have occurred during surface, air or water transport. Fixed-facility releases are defined as releases that occur at industrial sites, schools, farms or any other permanent location. All events are either fixed facility or transportation-related. An evacuation is defined as an event in which at least one person had to leave home or place of work. Injury data is gathered for all injuries related to the event.

Releases were categorized by season, time of day, period of the week, type of area where the release occurred, and amount of chemical released. Season was categorized as summer (May-October) or winter. Time of day was categorized as daytime (6 a.m. to 5:59 p.m.) or nighttime. Period of the week was categorized as weekday or weekend. Type of area was categorized as residential and/or commercial or not. We categorized all ammonia release sizes as at least 100 pounds or 10 gallons or less than these quantities. For simplicity, we refer only to the 100-pound threshold throughout the paper. One hundred pounds is the Environmental Protection Agency's threshold for mandatory reporting for ammonia releases.

SAS version 8 was used for all analyses.[4] Crude relative risks (RR) were calculated with Taylor series confidence intervals (CI). Logistic regression was used to calculate adjusted odds ratios (OR) and Wald CIs. Characteristics of ammonia releases were included as potential confounders in the multivariate models if they could be related to the number of people potentially at risk for evacuation or injury following an ammonia release.

RESULTS

A total of 2251 releases of hazardous chemicals were reported to HSEES in Wisconsin during 1993 through

Table 2. Relative risk of evacuation following ammonia releases from fixed facilities by weather conditions, quantity released, and location, Wisconsin, 1993-1998.

Characteristic	Evacuation occurred	No evacuation occurred	Crude RR[1] (95% CI)	Adjusted[2] OR[3] (95% CI)
Not during extreme weather	59	156	Referent	Referent
During extreme weather	10	27	0.98 (.56-1.75)	1.07 (0.37-3.10)
<100 pounds	24	117	Referent	Referent
³100 pounds	28	40	2.42 (1.52-3.84)	3.19 (1.49-6.86)
Outside	14	53	Referent	Referent
Inside	56	109	1.62 (0.97-2.71)	1.49 (0.63-3.48)

[1] Relative risk.
[2] Multivariate models included season, time of day, period of week, type of area, weather conditions, quantity released, and indoor vs. outdoor release.
[3] Odds ratio.

Table 3. Relative risk of injury following ammonia releases from fixed facilities by weather conditions, quantity released, and location, Wisconsin, 1993-1998.

Characteristic	Injury occurred	No injury occurred	Crude RR[1] (95% CI)	Adjusted[2] OR[3] (95% CI)
Not during extreme weather	18	209	Referent	Referent
During extreme weather	2	37	0.65 (0.16-2.68)	0.34 (0.04-3.04)
<100 pounds	3	144	Referent	Referent
≥100 pounds	11	65	7.09 (2.04–24.66)	11.71 (2.38–57.65)
Outside	6	69	Referent	Referent
Inside	13	158	0.95 (0.38–2.40)	1.04 (0.26–4.17)

[1] Relative risk.
[2] Multivariate models included season, time of day, period of week, type of area, weather conditions, quantity released, and indoor vs. outdoor release.
[3] Odds ratio.

1998 (Figure 1). The number of ammonia releases reported per year ranged from 40 to 58 (average=49). Ammonia releases accounted for 291 (13%) of all events reported to HSEES, range: 9%-16% per year (Figure 1B). During 1993 through 1998, a total of 282 releases led to evacuation and 163 led to injury. Ammonia releases accounted for 74 (26%) of 282 releases leading to evacuation, ranging from 20%-34% per year. Ammonia releases accounted for 22 (13%) of 163 releases leading to injury, range: 0%-21% per year. The corresponding relative risks for evacuation and injury following ammonia release compared with releases of other chemicals were 2.32 (95% CI, 1.84-2.93) and 1.05 (95% CI, 0.68-1.62), respectively. For 189 of the events reported to HSEES data on evacuation was missing.

The greatest number of hazardous ammonia releases occurred in the food processing or manufacturing industry followed by the agricultural industry (Table 1), and the most common sites for releases were commercial or residential areas. More ammonia releases occurred at fixed facilities, in summer, during the day, and during the week than during transportation, in winter, at night, and on weekends, respectively. Few ammonia releases occurred during extreme weather conditions (e.g. rain, snow, ice, sleet, fog, high winds, extreme temperatures or weather disasters). More ammonia releases were of quantities less than 100 pounds than of larger quantities. However, among transportation-related releases with available data on the size of the release, only five of 16 were less than 100 pounds. Among releases at fixed facilities, a greater proportion resulted from equipment failure or operator error than other factors (e.g. power failures or deliberate damage).

Among ammonia releases with available evacuation data, 70 of 258 fixed-facility releases resulted in evacuations, compared with 4 of 16 transportation releases (RR 1.09, 95%CI 0.45-2.60) (RR=Relative Risk). All four of the releases during transportation that led to evacuation were of quantities of at least 100 pounds and none of them occurred during extreme weather conditions. Three of these four releases were on weekdays, two were in the summer, and one also led to an injury. One of these releases was during the day, two during the night; information was unavailable for one. Five of nine transportation releases that did not lead to evacuation were also greater than 100 pounds.

Twenty of 272 ammonia releases at fixed facilities

led to injury compared with two of 19 releases during transportation (RR 0.70, CI 0.18-2.77). Both of the releases during transportation that led to injury were during the day, in the winter and at least 100 pounds. Neither occurred during extreme weather. One of the two releases was during the week. Among 14 transportation releases with available size data that did not lead to injury 9 were greater than 100 pounds.

Among ammonia releases from fixed facilities, the greatest risk factor for evacuation or injury was the quantity of ammonia released. Releases of at least 100 pounds of ammonia had crude relative risks for evacuation or injury of 2.42 (95% CI, 1.52-3.84) and 7.09 (95% CI, 2.04-24.66), respectively, compared with those with smaller quantities (Tables 2 & 3). This association persisted when adjusted for season, time of day, day of week, type of area, weather conditions, and whether the release occurred indoors or outdoors. Ammonia releases that occurred inside had greater risk of subsequent evacuation, but not of injury (but both 95% CIs included one). Extreme weather conditions did not increase the risk for either evacuation or injury following ammonia releases. In fact, the risk of injury following releases decreased during extreme weather, but the confidence interval was wide and included one (Table 3).

DISCUSSION

Both the number of ammonia releases and the fraction that they comprise of all emergency events reported to the Wisconsin HSEES have been relatively consistent during 1993 through 1998. The number of ammonia releases that lead to evacuation and injury has also remained relatively constant during this period. Ammonia releases account for a disproportionately large fraction of events that lead to evacuation (26%) and thus a relative risk for evacuation compared with other chemicals significantly greater than one. This is consistent with previous analyses of HSEES data from nine reporting states,[1] and might be expected because the irritant properties of ammonia make it more likely to be quickly recognized and acted upon than other chemicals. Ammonia releases in Wisconsin, however, are no more likely to lead to injury than releases of all other chemicals, unlike the previous findings from HSEES data from nine reporting states where the risk of injury following ammonia releases was greater than for other chemicals.[1]

The industries in which the most ammonia releases occur are agriculture and food processing or manufacturing. This is likely, in part, the result of these industries using the most ammonia. Nonetheless, this emphasizes the need for these industries in particular to consider initiatives to deal with hazardous ammonia release prevention. We also found ammonia releases to occur more during the summer, on weekdays and during the daytime, similar to findings for hazardous chemical releases in another study.[5]

The greatest risk factor for evacuation or injury following ammonia releases was a quantity of chemical released of at least 100 pounds. However, many more releases of less than 100 pounds were reported to HSEES in Wisconsin than larger releases, and almost as many smaller releases that led to evacuation and injury as larger ones. Transportation-related releases tended to be large, and all transportation releases that led to evacuation or injury were large. But transportation-related releases were less than 7% of all releases.

Although conventional wisdom might suggest that extreme weather conditions would increase the risk for evacuation or injury following ammonia release, we did not find this to be the case. In fact, at fixed facilities, evacuation and injury were less likely to occur following ammonia releases during extreme weather conditions. In addition, less than 15% of all ammonia releases occurred during such conditions. None of the transportation-related releases that led to evacuation or injury occurred during extreme weather conditions.

A limitation of this study is that Wisconsin does not require that all uncontrolled releases of hazardous chemicals be reported. Therefore, although the HSEES manager attempts to track down all such releases, data in HSEES may not represent every uncontrolled release. In addition, reliable information is not available concerning the number of persons who were at risk for evacuation or injury; this factor will affect the likelihood of either of these outcomes occurring. Missing data on evacuation for some of the events could also affect the results, although we have no reason to believe that the missing data were differentially distributed.

SUMMARY

These data indicate that almost as many small-scale releases lead to evacuation and injury as large releases. Therefore, efforts to avoid small-scale releases should not be disregarded while concentrating on avoiding larger releases. Furthermore, while the sometimes spectacular nature of releases that result from extreme weather conditions beyond human control or large-scale transport accidents may attract a lot of attention, these account for only a small fraction of ammonia releases and are not any more likely to lead to evacuation and injury than other types of releases. A large majority of ammonia releases are the result of equipment failure or operator error—both preventable factors. These data suggest that attention to preventive maintenance, and worker training and awareness could be effective tools to reduce the financial and health burdens of ammonia releases.

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Are Pesticides Really Endocrine Disruptors?

Richard A. Johnson, MS, RS; Robert E. Harris BS, RS; and Russell A. Wilke, MD, PhD

ABSTRACT

In recent years, a considerable amount of basic laboratory investigation has been targeted toward understanding the relationship between environmental contaminants and cellular endocrine function. A number of environmental contaminants are now known to alter endocrine physiology without acting as classic toxicants. Hence, a new field of inquiry has emerged within the discipline of environmental toxicology, the study of endocrine disrupting chemicals (EDCs).

Pesticides represent one of the better studied groups of EDCs. As the tools of molecular biology become increasingly sophisticated, our ability to understand the endocrine effects of these compounds continues to broaden at a remarkable rate. Still, clinical data linking them to derangements in human endocrine function have been quite limited. While the scientific community awaits further epidemiological assessment of the impact of pesticides on public health, responsible land management practices should be employed in an effort to reduce the burden of these chemicals ultimately reaching our water supply.

INTRODUCTION

The potential role of environmental contaminants as endocrine disrupting chemicals has received a considerable amount of media attention in recent years.[1,2] Although wildlife biologists and public health officials have been investigating reports linking environmental contaminants to reproductive anomalies for decades, public interest in this area was heightened in 1995 when a group of Minnesota school children discovered dozens of multi-legged frogs in a local farm wetland.[3] Since then, a great deal of research has been aimed at defining the mechanism whereby environmental agents disrupt cellular endocrine function.

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Many environmental contaminants are now known to alter cellular physiology without acting as classic toxicants; rather, they modulate the production, release and downstream signaling effects of hormones. The agricultural pesticides represent one such class of compounds. Loosely defined, the term "pesticide" refers to herbicides, fungicides and insecticides. This article summarizes what is currently known about the effects of pesticides on cellular endocrine function, and it explores the relevance of these observations to human health.

HERBICIDES

Herbicides are chemicals used to kill unwanted plants. The earliest known herbicides were inorganic compounds. Over a century ago, a number of metals (e.g., copper salts) were used in agriculture for their selective herbicidal properties. By 1950, solutions of sodium arsenite had become the industry standard. Although agents such as these are still in use today, more than 90% of all herbicides are now synthetic compounds. With more than 500 million pounds of herbicide active ingredients being applied to US agricultural fields yearly,[4] these agents are, by far, the most widely used class of pesticides in use today.

Synthetic Organic Acids

Chlorophenoxy acids were among the earliest synthetic herbicides to gain widespread commercial use. These agents were originally developed for their ability to control broadleaf weeds in cereal crops. Historically, the chlorophenoxy acid 2,4-D has been one of the most widely used herbicides in the developed world. Although its toxicity in non-endocrine systems is a matter of ongoing debate, no significant endocrine abnormality has been associated with the use of this compound. Unfortunately, the combustion process employed in the synthesis of chlorophenoxy acids can sometimes yield low levels of dioxin contaminants. Unlike their parent compounds, some dioxins have been shown to disrupt endocrine function in experimental animals. Although dioxin contaminants have been clearly documented in earlier synthetic preparations of 2,4-D (e.g., agent orange), newer formulations of these herbicides do not

contain these contaminants, and their ability to induce alterations in clinical endocrine function therefore appears to be negligible.

The dibenzoic acids represent another class of synthetic herbicides developed for their ability to selectively control broadleaf weeds. Dicamba is the prototypic agent in this class. Although its acute toxicity appears to be quite limited, this agent has recently been shown to upregulate cellular expression of the peroxisome proliferator activated receptors (PPAR's). Although PPARγ is known to mediate the effects of several newer anti-diabetic agents on adipocyte function,[5] dicamba's impact on lipids and glucose homeostasis remains to be determined.

Triazines

According to overall poundage, the triazines represent the most widely used class of herbicides currently in use. More than 70 million pounds of atrazine alone are applied to US agricultural fields yearly.[4] Animal studies have shown that this agent can disrupt ovarian cycling *in vivo*, an interaction which may be attributable to atrazine's ability to decrease the expression of estrogen receptor-dependent genes.[6] Furthermore, the endocrine effects of triazine herbicides are not limited to derangements in female reproductive physiology. In the hypothalamus of male rats, these agents have been shown to inhibit the activity of 5a-reductase, the enzyme which converts testosterone to its active metabolic form. Other studies have suggested that triazines can alter serum levels of both thyroxine and growth hormone. Although these agents appear to demonstrate a great deal of species-specificity, the data obtained in experimental model systems raises questions about the potential impact of these agents on public health. Further epidemiological studies will therefore be needed to characterize the nature of any relationship that might exist between triazine herbicides and clinical endocrine function.

Other Selective Herbicides

The acetanilide herbicides, including alachlor, have been associated with derangements in thyrocyte proliferation in experimental animals. Like many xenobiotics, these agents are known to increase the process of hepatic biotransformation. It has been proposed that the resultant increase in hepatic clearance of thyroxine may induce a relative hypothyroid state which promotes follicular hyperplasia through chronic stimulation by TSH.[7] Such a hypothesis must be approached with caution, however, since recent epidemiologic studies have failed to reveal any functional thyroid abnormality in humans exposed to alachlor in an occupational setting.[8]

Another class of herbicides thought to induce derangements in thyroid function has been the diphenyl ethers. Prenatal exposure to nitrofen has been associated with a constellation of congenital anomalies, all containing the common feature of severe fetal lung hypoplasia. Although premature birth alone can account for hypoplastic pulmonary changes, recent data have suggested that the congenital lung pathology associated with nitrofen exposure may be related to the downregulation of thyroid-dependent transcription factors. Interestingly, nitrofen has previously been shown to inhibit the binding of triiodothyronine to its receptor, *in vitro*.[9] It is therefore plausible that the fetal pathology associated with exposure to diphenyl ethers represents a secondary manifestation of their ability to induce derangements in thyroid function, *in utero*.

Non-selective Herbicides

Unlike most of the agents discussed above, the bipyridyliums (e.g., diquat and paraquat) were initially developed and marketed for their activity as non-selective herbicides. Compounds in this class do not discriminate in their ability to cause plant toxicity on contact. Bipyridyliums are also highly toxic to experimental animals. Fortunately, since these agents are rapidly bound to and degraded by the soil, human toxicity is rarely seen.

Like the bipyridyliums, some organophosphates also function as non-selective herbicides. Their mechanism of action, however, is quite unique. Rather than acting directly on contact with the plant surface, these organophosphates function as systemic herbicides. Perhaps the most well known example of this class is glyphosate, the active ingredient in Roundup. Following application, glyphosate is absorbed and distributed throughout the entire plant, where it inhibits the function of key metabolic enzymes. Because glyphosate and other organophosphate herbicides lack the cholinesterase-inhibiting activity of their insecticide counterparts (see below), the acute toxicity of these agents has been relatively low in animal models. To date, no endocrine abnormality has been associated with exposure to these non-selective synthetic herbicides.

FUNGICIDES

Fungicides are widely used in agriculture to control fungal growth on the surface of plants and seeds. Copper salts were among the earliest agricultural fungicides, and they are still used extensively today. Most are sold as wettable powders under a variety of trade names. No derangement in endocrine function has yet been attributed to their use.

Organic mercury-based compounds have also been used as agricultural fungicides for many decades. These compounds have long been known to cause direct neurotoxicity. Since organic mercurials readily cross the placenta, they have also been associated with the development of several reproductive abnormalities.

Prenatal exposure to methylmercury can cause significant neuronal dysfunction in human infants even when signs of poisoning in the mother are mild. Still, no direct link has been found between organic mercury-based compounds and endocrine function. (Inorganic mercury has recently been shown to alter steroidogenesis in experimental animals, but these simpler metals have not been employed as pesticides, and a discussion of their toxicity is therefore beyond the scope of this review.)

Dithiocarbamates

Dithiocarbamates were among the earliest synthetic fungicides to be used commercially. Due to their relatively low acute toxicity, these agents still enjoy widespread use today. Although dithiocarbamates have been shown to interact with a number of hormonal axes in experimental animals, only thyroid function has been convincingly altered in humans. Occupational studies have revealed that ethylene-bis-dithiocarbamates can induce subclinical hypothyroidism in agricultural workers chronically exposed to these agents.[10] Since the organification of iodine by thyroid peroxidase can be inhibited by dithiocarbamates *in vitro,* it is likely that these fungicides alter thyroid homeostasis by directly modifying thyrocyte function, *in vivo.*

Dicarboximides

Several dicarboximides, including vinclozolin, are currently registered for use in the control of fungal growth on fruits and vegetables. Recently, these agents have received a great deal of media attention due to their properties as anti-androgens. Multigenerational studies conducted in rodents have demonstrated that dicarboximides can alter the development of sexual phenotype. Reduced anogenital distance, nipple development and hypospadias have all been documented in male rat pups exposed to vinclozolin *in utero*.[11] Electrophoretic mobility band shift and promoter interference assays have since attributed these abnormalities to the transcriptional inhibition of dihydrotestosterone sensitive genes. Interestingly, experimental animals exposed to dicarboximides for sustained periods of time have also been found to acquire an increased incidence of endocrine-derived neoplasms. Although the cellular mechanism linking dicarboximide exposure to the development of endocrine tumors remains undefined, it is conceivable that the transformation of these cell lines could be related to fungicide-induced alterations in nuclear receptor function. The use of these agents should therefore be continued with caution.

INSECTICIDES

Insecticides are designed to disable the nervous systems of complex, multi-cellular organisms. Accordingly, these agents are almost invariably toxic to humans. While most of their adverse effects are manifest as changes in neuronal function, a number of insecticides have also been shown to disrupt cellular endocrine function. These agents are discussed below.

Organochlorines

Of the many classes of commercially available insecticides, none has been more intimately linked with derangements in endocrine function than the organochlorines. The disruption of avian reproduction by dichloro-diphenyl-trichloroethane (DDT) represents one of the most publicized examples of endocrine disruption in popular American history. Scientists have known for decades that these agents reduce the reproductive success of a number of wild bird species. Recent molecular analyses have revealed that many organochlorine insecticides exert their toxic effects by acting as estrogen mimics. In yeast transiently transfected with estrogen receptors, both DDT and its primary metabolic derivative (DDE) have been shown to induce the expression of estrogen-dependent reporter genes.[12] Similar findings have been reported for the newer organochlorine insecticide, methoxychlor.

Furthermore, a number of organochlorines also function as anti-androgens. *In vitro,* methoxychlor and its hydroxylated metabolite (HPTE) inhibit the ability of dihydrotestosterone to activate androgen-dependent reporter genes.[13] Methoxychlor has also been found to reduce sperm counts in experimental animals. Although the data linking organochlorine insecticides to derangements in male reproductive function have been considerably less convincing in humans, these agents remain one of the more intensively studied classes of agricultural pesticides. Further molecular and epidemiological analyses should eventually clarify their relevance to public health.

Pyrethroids

The pyrethroid insecticides are commonly used to control household as well as agricultural pests. Their naturally occurring parent compounds were originally extracted from Chrysanthemum flowers. At present, more than 20 synthetic pyrethroid derivatives are commercially available. All disrupt the function of insect nervous systems by modifying sodium channels.[14] Despite the intimate relationship that exists between ion channels, membrane excitability and hormone secretion, very few endocrine abnormalities have been attributed to the use of these agents. Interestingly, several synthetic pyrethroids have been shown to function as weak estrogen receptor agonists *in vitro,*[15] but the potency of these agents in endocrine assay systems has been limited and no reproductive abnormality has yet been associated with their use, *in vivo.*

Carbamates and Organophosphates

More than 60 carbamates and 100 organophosphates are commercially available for use as insecticides. Most

Table 1. Common and Trade Names Pesticides

Herbicides		Fungicides		Insecticides	
Common Name	Trade Name	Common Name	Trade Name	Common Name	Trade Name
Chlorophenoxy acids		*Copper salts*		*Organochlorines*	
2,4-D	Weedone	Copper carbonate	Copsol	DDE	DDE
2,4,5-T	Dacamine	Copper hydroxide	Kocide	DDT	DDT
MCPA	Bronate	Copper sulfate + lime	Bordeaux	Methoxychlor	Marlate
MCPP	Mecoprop	*Organic mercurials*		*Carbamates*	
Silvex	Fenoprop	Methoxyethyl mercury	Emisan	Aldicarb	Temik
Dibenzoic acids		Methyl mercury	MEHG	Carbaryl	Sevin
Dicamba	Banvel	Phenylmercury acetate	Agrosan	Carbofuran	Furadan
Triazines		Setrete	Gallotox	*Organophosphates*	
Amitrole	Amizole	*Organic tin compounds*		Chlorpyrifos	Lorsban
Atrazine	Aatrex	Dibutyl tin	DBT	Malathion	Cythion
Cyanazine	Bladex	Tributyl tin	TBT	Parathion	Nitran
Metribuzin	Sencor	Tricyclohexyl tin	Cyhexatin	*Pyrethroids (Natural)*	
Propazine	Milogard	Triphenyl tin hydrox.	TPTH	Cinerin	Cinerin I/II
Simazine	Princep	*Dithiocarbamates*		Jasmolin	Jasmolin I/II
Acetanilides		Ferbam	Carbamate	Pyrethrin	Pyronone
Alachlor	Lasso	Mancozeb	Manzate	*Pyrethroids (Synthetic)*	
Metolachlor	Dual	Metam	Trimaton	Allethrin	Pynamin
Propanil	Strel	Metiram	Polyram	Cypermethrin	Cymbush
Diphenyl ethers		Nabam	Dithane A	Fenvalerate	Pydrin
Nitrofen	Benzenamine	Zineb	Dithane Z		
Oxyfluorfen	Goal	Ziram	Milban		
Bipyridiliums		*Dicarboximides*			
Diquat	Diquat	Procymidone	Sumilex		
Paraquat	Gramaxone	Vinclozolin	Ronilan		
Organophosphates		*Morpholines*			
Glyphosate	Roundup	Fenpropimorph	Fenpropimorph		
Glufosinate	Liberty	Tridemorph	Tridemorph		

of these agents are potent inhibitors of acetyl cholinesterase, and their toxicological effects can therefore usually be attributed to the inhibition of this enzyme. To date, the only endocrine axis linked to the use of these compounds in animal models has been thyroid function. Aldicarb, a representative carbamate, has been shown to decrease circulating levels of thyroxine in experimental rats. Similar findings have been reported for the organophosphate, malathion. Since malathion is often employed to control mosquito populations in residential areas, its ability to alter thyroid homeostasis may be relevant to human health. Although no abnormalities in thyroid function have yet been reported in humans exposed to these agents, monitoring may be appropriate in areas where their use is mandated by an increasing incidence of arboviral illness.

DISCUSSION

Endocrine disrupting chemicals are environmental contaminants that modulate the production, release or downstream signaling effects of hormones in experimental assay systems. In recent years, scientific interest in these agents has expanded rapidly, due in part to the realization that environmental estrogens can alter mammalian reproductive function. Although many pesticides have been shown to interact with estrogen receptors, the endocrine disrupting capabilities of these agents are by no means limited to a single molecular interaction. In the lab, other pesticides have been shown to alter the function of a variety of hormonal axes, particularly thyroid function.

Although many environmental contaminants, including pesticides, have been found to be potent modulators of endocrine function in cellular assay systems, biological plausibility alone does not prove that these agents have a significant impact on public health.[16] Despite the presence of intriguing molecular interactions, many of these potential endocrine-disrupting chemicals have failed to alter any physiological process *in vivo*. This is partly due to the fact that the US Environmental Protection Agency (under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act) requires that all commercially available chemicals undergo an extensive battery of screening tests in animal models prior to market.[17] In addition, the US Congress also recently mandated (via the Food Quality Protection Act and the Safe Drinking Water Act) that all such chemicals specifically be screened for hormon-

al activity.[18] Chemicals failing this review, such as DDT, are eventually removed from the market. Furthermore, for any xenobiotic to have a significant effect on public health, the human population must also be subject to a meaningful exposure.[19] The extent to which the general public is actually exposed to pesticide residues is highly controversial, and it remains a matter of ongoing scientific debate.

Although several insightful studies on pesticide toxicity have been conducted in the occupational medicine arena, the field of endocrine disruption suffers from a considerable lack of published information on the effects of these agents in the general population. So what do we do, as a public, while awaiting the results of further epidemiological analyses? As always, the key to controlling xenobiotic toxicity is prevention. Currently, Wisconsin law requires that farmers and commercial pesticide applicators (agribusiness, plant nurseries, contract pest control, etc.) follow strict guidelines during the use of these agents. No such restrictions exist for household use; homeowners who purchase non-restricted use pesticides are expected to read and follow label directions to reduce hazard exposure. It therefore seems prudent to increase public awareness of the potential risk of working with these agents, until their endocrine effects are more completely understood. Furthermore, although children are not usually involved in the direct handling of these chemicals, they may still be exposed to pesticide residues through equipment and clothing used by adult applicators. Due to the potentially detrimental effect of various pesticides on growth and development, precautions need to be taken to avoid such indirect exposures as well.

Generally speaking, however, public exposure to environmental pesticide residues appears to be quite limited. Unlike the occupational setting, where agricultural or industrial workers can be acutely exposed to high levels of chemicals through dermal and inhalational routes, the general public is more likely to be exposed to pesticides chronically through the low level contamination of groundwater and/or foodstuffs. For this reason, the US Food and Drug Administration (FDA) regularly monitors the level of pesticide residues in soil sediments, water sources and food items. Recently, the results of this monitoring were made readily available to the public when the FDA published the information (on the world wide web) as part of the National Food Safety Database. While most commercial agricultural products routinely test well below the detectable limits for pesticide contaminants, leafy vegetables occasionally contain small but detectable amounts of these chemicals (presumably due to difficulty in the pre-market washing of this form of produce). In that regard, the public is well-advised to continue washing fruits and vegetables prior to consumption.

From an overall land management standpoint, injecting agricultural chemicals directly into the soil (rather than spraying them on the surface) has traditionally helped reduce the concentrations of these agents appearing in agricultural runoff. This practice should be encouraged. Additionally, models for estimating the development of insecticide resistance are continually being improved.[20] Implementation of these models should eventually reduce the need for repeat application. Still, despite genuine efforts on behalf of the agricultural industry to employ judicious application principles, erosion and other physical forces have continued to allow many of these agents to gain access to surface waters. Bodies of water found to contain various levels of pesticide contaminants have ranged from the Great Lakes to small rural wetlands. Since wetland sediments are known to be more efficacious at inactivating pesticides than other soil materials, it seems prudent that efforts also be made to ensure the preservation of wetlands.

In summary, basic laboratory investigation has yielded a tremendous amount of insight into the possible role of pesticides as endocrine disruptors over the last decade. Unfortunately, the clinical relevance of these molecular interactions remains undefined. Until more convincing epidemiological data become available, the implementation of responsible land management strategies should help reduce the potential impact of agricultural pesticides on public health.

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Radon in Wisconsin

Conrad Weiffenbach, PhD, and Henry A. Anderson, MD

ABSTRACT

Owners of about 15% to 20% of the homes in Wisconsin have tested their indoor air for the carcinogenic gas radon. Five percent to 10% of homes have year-average main-floor radon levels that exceed the US Environmental Protection Agency (EPA) exposure guideline, and they are found in most regions of the state. Attempting to retroactively seal foundations to keep radon from the ground out of a home is largely ineffective. However, a soil-depressurization radon mitigation system is highly effective for existing houses, and new homes can easily be built radon-resistant. As the number of homeowners obtaining needed repairs increases, significant lung cancer risk reduction is being achieved in a voluntary, non-regulatory setting. In coming years, as radon in community drinking water supplies becomes regulated under the federal 1996 Safe Drinking Water Act, the "multimedia" option of the act may result in additional attention to mitigation of radon in indoor air.

INTRODUCTION

Radon, a natural, odorless radioactive gas that comes from trace amounts of uranium in the ground, is classified by the US EPA as a known human carcinogen. State and local public health programs in Wisconsin to reduce exposures to radon in indoor air began more than 10 years ago. Although it is not currently regulated, according to a survey[1] with N=900, 83% of the public in Wisconsin have heard about radon and probably 15% to 20% of the homes in the state have been tested.

A recent 500-page report[2] from a National Academy of Sciences committee strongly supports the lung cancer risk estimates for radon used by the US EPA.

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The report is a comprehensive, significance-weighted review of all the evidence. Lung cancer is the only known health effect. The risk estimates are based on studies of large cohorts of underground miners exposed to radon, case-control studies of lung cancer and residential radon, and biological evidence that cancer has a monoclonal origin (i.e. tumors start with a single genetic type, then multiple mutations develop in later stages). The report estimates that there are about 15,000 or 20,000 lung cancer deaths nationwide per year due to residential radon exposure; 2000 to 3000 of them are among never-smokers; and about one-third of them are preventable. The lifetime individual risk of lung cancer from radon at the EPA residential guideline level, 4 picoCuries per liter (148 Bequerels per cubic meter), is about 0.2%[3] to 0.7%[4] for never-smokers. Tobacco smoke is a co-carcinogen with radon. Smokers and former smokers have five[4] to 15[3] times the risk from radon of never-smokers. Although tobacco smoke is by far the predominant cause of lung cancer, radon control is a way for former smokers and never-smokers to reduce their lung cancer risks.

Radon testing, and home remediation for those confirmed to have elevated radon, are continuing at a steady rate in Wisconsin. Congress is continuing funding for outreach by the states. Public skepticism continues in some quarters, as for other environmental health concerns, but seems to be diminishing.

RESIDENTIAL MEASUREMENTS

The map (Figure 1) indicates the estimated geographic distribution by ZIP code of homes with elevated main-floor radon exposures in Wisconsin. To produce this map, we obtained 48,000 results of two- to five-day basement measurements from a variety of certified detector laboratories between 1987 and 1995. We measured ratios for year-average main-floor radon test results to two-day basement test results for 200 houses which had two-day basement results above 4 picoCuries per liter (pCi/L) in a statewide random survey[6] of 1000 homes. The ratios for individual houses ranged from 10% to 100%, while the distribution average and peak was 40%. In making the map, basement results

above 10 pCi/L were assumed to represent main-floor year-average radon levels above four pCi/L statistically.

ZIP codes for which we had less than three measurements are coded on the map as 'insufficient data.' Although the data are not for randomly selected homes, the distribution by ZIP code in the map agrees, but with higher geographic resolution, with the distribution by county in the US EPA map[5] of radon zones in Wisconsin.

The Wisconsin Division of Public Health (DPH) recommends that all homes with occupied spaces at or below ground level should be tested for radon. The rationale for this recommendation is based upon the following:

1. Homes with elevated radon levels are found in all regions.
2. Test results in neighboring homes do not indicate what the radon will be in a given home.
3. Home radon tests only cost around $20.

RESIDENTIAL RADON CONTROL

Radon enters basements through cracks and openings when basement air pressure is lower than the pressure of the air with radon in the soil and gravel under the floor slab. Attempting to seal cracks and openings through foundations to keep radon out is seldom effective, but homes can be built[7] radon-resistant, and the soil-depressurization radon mitigation system[8] (costing about $1200) is highly effective as a retrofit to reduce radon in existing houses. In soil depressurization, after sealing openings to soil through the foundation, air is sucked out from under the basement floor with a continuously-running fan in a 4-inch polyvinyl chloride plastic stack leading to the roof. By reversing the pressure difference across the floor slab, this method is highly effective at preventing radon entry, no matter how high the radon levels are under the slab.

Operating costs (for energy) for a soil depressurization system are $75 to $150 per year.[8] Over 70 years, the cost for installation and operation is around $8000. The resulting typical cost to a homeowner per lung cancer death prevented can be estimated at around $300,000, assuming only 4 pCi/L reduction in average radon exposure, a corresponding 1.0% reduction in an individual resident's lung cancer risk over a lifetime, and 2.8 residents in the household. The 1.0% risk is close to the latest estimate[4] for never-smokers. For residents with other smoking status or mitigating homes with higher radon levels, cost/benefit ratios are even more favorable. Including costs for government outreach and all radon testing nationwide, the EPA has estimated[9] the average cost per lung cancer death prevented at $700,000.

Probably 5% to 10% of the houses in Wisconsin, or about 100,000 houses, have average main-floor radon levels exceeding the EPA guideline, comparable to other states in the region.[10] Although radon mitigation businesses are not regulated in Wisconsin, 20 have voluntarily obtained certification by proficiency programs.[11,12] They, and about an equal number who have let their certifications expire, install at least 1000 of the highly-effective soil depressurization radon mitigation systems per year. Since the number of mitigation contractors active in the state has been roughly the same through the last eight or more years, one can estimate that perhaps 10,000 soil depressurization systems have been installed in Wisconsin.

Far more effective, in terms of cost/benefit, is construction of radon-resistant new homes. The recommended method[7] is inexpensive (adding about $300 to the cost of a new home in most regions of Wisconsin), but requires that builders learn to avoid or seal openings through foundations during construction. There is some radon-resistant new construction in high-radon zones, particularly in the north-central region of the state. Builders in these areas have the most experience with radon concerns of buyers.

Fourteen local health agencies in Wisconsin serve as regional Radon Information Centers, with a single toll-free number, 888-LOW-RADON. They do radon outreach, and the public consults with them on radon testing and radon reduction. The needed information about radon can be communicated to the general public in stages.

The first stage gives simplest messages for everyone:

- "Radon is the second leading cause of lung cancer."
- "It is odorless and widespread."
- "Test your home. It's easy to do."

The second stage includes messages for people responding to the first stage. How to test:

- "Test in the lowest occupied space, with closed-house conditions."
- "EPA's radon guideline is 4 pCi/L"
- "If first test result is elevated, do follow-up testing for up to a year."

The third stage is for people with exposures confirmed to be elevated:

- radon mitigation, how to obtain it, and costs;
- the quantitative risk of lung cancer that can be avoided.

REGULATION OF RADON IN COMMUNITY WATER SUPPLIES

Effective February of 2005, the US EPA and Wisconsin Department of Natural Resources will regulate radon in community water supplies, as called for in the 1996 amendment of the Safe Drinking Water Act.

A National Academy of Sciences committee has issued a 279-page report, *Risk Assessment of Radon in Drinking Water*,[4] which summarizes current knowledge

Figure 1. Estimated Percent Homes Having Elevated Radon Year Average, Main Floor

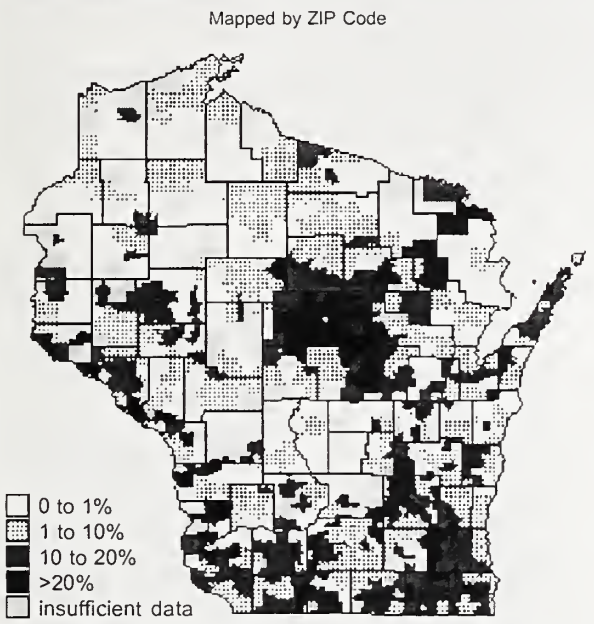
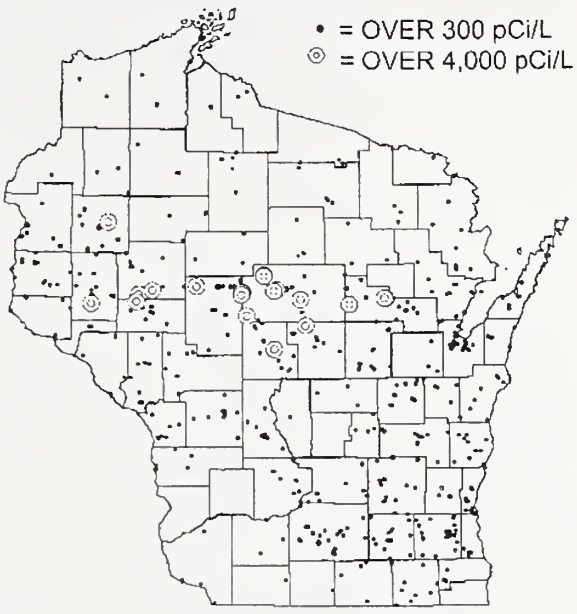


Figure 2. Radon in Community Wells



for use in the development of regulation. Water supplies are estimated to contribute 1% of the total risk from domestic exposures to radon: 160 lung cancer deaths and 20 stomach cancer deaths per year. The remaining risk is attributable to radon entering indoor air through foundations. Most (89%) of the risk from radon in water results from inhalation of radon which was released to the indoor air during household water uses such as laundering and showering.

The EPA has published[13] a proposed rule for the regulation. Only community wells are affected. The accompanying map (Figure 2) shows locations of community wells with radon test results[14] above the proposed Maximum Contaminant Limit (300 pCi/L), and above a proposed Alternative Maximum Contaminant Limit (4000 pCi/L). Because radon in drinking water has not been regulated, testing of community wells has been infrequent and sporadic, so these results should only be considered as preliminary. Based on current Department of Natural Resources data on radon in community water supplies, we estimate that perhaps 30% of the community wells in Wisconsin exceed 300 pCi/L.

The cost of treatment to reduce radon in water is high, estimated to add $30 to $200 per year to the water bill of each household served by the small groundwater systems that are most affected[13]. If radon in water is reduced to the proposed MCL, at that level it contributes less than one-tenth the risk of the average outdoors ambient radon, and less than one fiftieth the risk of the average main-floor radon in homes. The cost-to-benefit ratio for controlling radon in community water supplies is quite high in comparison with treatments available to prevent radon from entering indoor air directly from the soil.

A MULTI- MEDIA APPROACH TO RADON RISK REDUCTION

Although clinical and public health approaches to risk are holistic and consider the total dose delivered to an individual from all sources (cumulative exposure and risk), regulatory approaches have traditionally been categorical, with standards set for individual media; water, air, food, etc. The passage of the Food Quality Protection Act and the 1996 amendments to the Safe Drinking Water Act requires regulators to assess cumulative and aggregate exposures. This new approach has been most visible in the regulation of pesticides (considering food, drinking water and residential use). However, the proposed regulation for radon in drinking water also provides an alternative multi-media strategy to reduce radon exposures. If Wisconsin chooses this strategy, only about a dozen community water supplies that exceed an *Alternative* Maximum Contaminant Limit (4000 pCi/L), with risk corresponding to the average radon in ambient outdoor air, will have to install equipment to reduce the radon.

States can qualify for the Alternative Maximum Contaminant Limit (AMCL) if they adopt a state 'multi-media mitigation' plan as part of the water regulation. The plan must lead to effective action to reduce radon in indoor air coming from the soil. The

cumulative statewide soil radon exposure must be reduced at least to the extent of the difference between the protection by the 300 pCi/L MCL and the 4000 pCi/L AMCL. A preliminary assessment indicates that for Wisconsin to qualify, about 250 more homes would have to be given radon mitigation by soil depressurization each year in connection with the water regulation. That is the number that would offset the additional risk allowed with the AMCL. Building 1200 new homes each year with radon-resistant construction in high exposure areas would also qualify.

Using EPA's estimates for the cost of water treatment[13] and the Wisconsin Department of Natural Resources' data on radon levels in community water supplies[14], we estimate the savings in household water bills in Wisconsin, if the AMCL is the standard instead of the MCL, will total $10 million per year. Far more risk could be eliminated if those funds were spent by homeowners in reducing radon exposures from soil. An increase of $100 per year in a homeowner's water bills adds up, over a lifetime, to about the same cost as a soil depressurization system, including operating costs. Thus the rationale for the AMCL is that ratepayers would accept somewhat higher radon levels in their drinking water because they can reduce elevated radon levels in their homes in a more cost effective manner than provided by more stringent water regulation.

The Wisconsin Department of Health and Family Services will be involved, with the Wisconsin Department of Natural Resources and other concerned organizations, in developing a state plan for regulation of radon in drinking water. As public input is taken, we expect that the innovative multi-media regulatory approach will receive considerable attention. If effectively implemented, the multimedia approach would result in a greater net improvement in public health, at lower overall costs to the public. With the existing infrastructure of 14 Radon Information Centers and 20 certified radon reduction businesses in the state, we have a head start in implementing a multimedia approach without burdening the water supplies with multimedia duties.

Radon exposure presents a case where rationalization across environmental media of expenditures to control risks could prove a very effective policy. If the multimedia approach for regulating radon in drinking water is accepted and proves to be effective, it may be possible to adopt it for other multi-media toxins, such as lead.

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WISCONSIN MEDICAL JOURNAL

Fish Consumption Habits and Advisory Awareness Among Fox River Anglers

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ABSTRACT

Eating PCB-contaminated fish caught from the Lower Fox River, northeast Wisconsin, has raised concern about the health risk to consumers, especially to children and unborn babies. The fish advisory published by the state of Wisconsin recommends which fish are safe to eat. However, there is reason to believe that many anglers, especially non-English speaking anglers, are not aware of the advisory and the possible health risks of eating contaminated fish.

A face-to-face survey administered to 104 anglers fishing along the Fox River indicates that 17% of anglers eat some or all of the fish they catch and that 83% practice "catch and release." Almost all the anglers were not familiar with Wisconsin's fish advisory but had heard of the health risks from their local newspaper and TV. As a follow-up, a fish health advisory brochure specific to the Fox River was developed.

INTRODUCTION

Polychlorinated biphenyls (PCBs) are a group of 209 man-made compounds. They were once widely used in electrical equipment, in industrial applications and in the manufacture and recycling of carbonless copy paper. PCBs were also present in recycled paper made from carbonless copy paper.

A major non-occupational source of exposure to PCBs comes from eating fish from contaminated waters. PCB molecules bind easily with sediment particles and eventually sink to the river or lake bottom. Bottom-dwelling marine life ingest these PCBs and these organisms are then eaten by fish. PCBs build up and are stored in the fat of fish. Bigger fish eat these contaminated fish, increasing the concentration of PCBs up the food chain. The concentrations consumed by humans at the end of the food chain can be significant. PCBs can build up over time in the fat tissue of humans eventually causing health problems.

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PCBs have been designated as carcinogens by the Environmental Protection Agency (EPA). Exposure in humans over a long period of time may increase the risk of cancer. PCBs also cause noncarcinogenic effects, primarily to the nervous and reproductive systems. Especially at risk are women of childbearing age, nursing infants and young children. Research has shown that mothers who consume large amounts of PCB contaminated fish can pass these contaminants on to their babies during pregnancy and breastfeeding. Babies exposed to PCBs in utero and during breastfeeding can have lower birth weights, smaller head sizes and delayed physical development and learning disabilities.[1,2,3] In 1976 the federal government banned the production of PCBs in response to public concern about the danger and long-lasting effects to wildlife and human health.

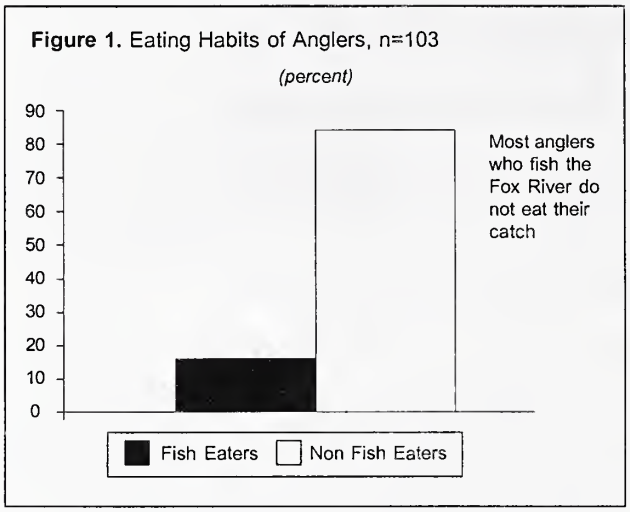
PCBs were discharged into the Fox River in the 1950s, 1960s and 1970s. Although use and discharge are no longer permitted, over 60,000 pounds of PCBs are estimated to be present in the river sediment and continue to serve as a reservoir continuing to contaminate the resident fish. Because eating these contaminated fish is a health concern, the Wisconsin Department of Natural Resources (WDNR) and the Wisconsin Department of Health and Family Services (WDHFS) jointly publish a statewide fish advisory that includes the Fox River. This advisory recommends which species of fish to limit eating or avoid eating.

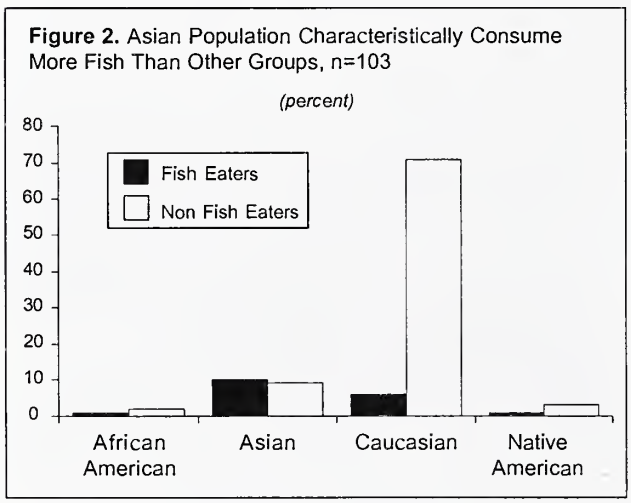
There is community concern that anglers and their families who fish the Fox River are being exposed to unsafe levels of PCBs because many anglers frequently seen fishing the river may be eating the contaminated fish. Many anglers, especially minorities and non-English speaking immigrants, are unaware of the fish advisory and do not understand health risks from eating the fish. The purpose of this study was to characterize the fishing habits of the anglers who fish along the Fox River and measure their awareness of the fish advisory.

METHODS

Survey Methods

Two popular fishing sites along the Fox River were selected to administer the face-to-face surveys. These





sites were chosen based on information obtained from Brown County wardens. The two sites selected were Voyageur Park in DePere and the Metropolitan Boat Landing in Green Bay. Efforts were made to interview all anglers fishing on shore at both sites. A WDHFS staff member administered the survey to English-speaking anglers and an interpreter was hired to administer the survey to the Hmong and Laotian-speaking anglers. Few anglers refused to participate although some anglers did not respond to all questions. The surveys were administered during daylight hours on weekdays and weekends. A Statistical Analysis System (SAS) (SAS Institute, 1994) program was developed to randomly select two days a week for each interviewer to be on site. The interviews were conducted from May 1999 until October 1999.

Survey Design

WDHFS staff members developed a brief survey characterizing angler's fish consumption habits and fish advisory knowledge. The survey was divided into three sections:

1) *Fishing and Fish Consumption Habits* section obtained information about fish the anglers catch including whether they or anyone in their household eat any of their catch. If they do eat their catch, the survey obtained information about which types of fish they eat and how often they eat these types of fish. If they don't eat their catch the survey obtained information about what they do with the caught fish.

2) *Sport Fishing Health Advisory Awareness* section asked if they have heard or read anything about the health risks of eating fish caught from the Fox River, what they have heard and where they heard this information. Also they were asked if they were aware of the fish advisory brochure published by the WDNR and the WDHFS. If they had not seen or heard of it, they were offered a copy by the interviewer.

3) *Demographics* section obtained information about the angler including birth date, race, income and education level, and name.

Statistical Analysis

Responses from all surveys were coded and entered into a database. WDHFS staff validated all data entered. Data were analyzed using SAS.

RESULTS

A total of 104 anglers completed the survey. One of the surveys was eliminated from analysis because the fish the angler reported eating were not caught in the Fox River. Of the 103 anglers surveyed 83% reported they did not eat any of the fish they caught, and 17% reported they ate some or all of the fish they caught (Figure 1).

Asian anglers make up the largest group of those who reported eating fish (59%) (Figure 2).

Of the anglers who did not eat the fish, 75% said they did not eat the fish because they were concerned about the contaminants, 11% said they didn't like the taste, and 5% said they fished for sport or trophy. Most of the non-fish eating anglers (91%) practiced "catch and release." Of those who reported eating the fish, Caucasian anglers reported that they like to eat the walleye but most Caucasian anglers reported they eat them only in the spring and the fall because they believe that those walleye caught at that time originate from Lake Michigan and are not contaminated. Most Asian anglers reported that they prefer to eat the White Bass. White Bass is on the list of "Do Not Eat" fish in the fish advisory.

Eighty seven percent (87%) of the non-fish eating anglers reported they were not aware of the fish advisory pamphlet published by the WDNR and the WDHFS. Of those anglers who reported eating fish, 95% said they were not aware of the fish advisory pamphlet (Figure 3).

Five percent (5%) of the non-fish eating anglers reported they had not heard or read about the health

risks of eating fish caught from the Fox River. Fifty percent (50%) of those who reported eating fish had not heard or read about the health risks. Asians represented 70% of the anglers who had not heard about the health risks (Figure 4).

The majority of the anglers interviewed were male (88%). Most anglers were Caucasians (75%). Asian (Hmong and Laotian) anglers represented 19% of the anglers, Native American anglers represented 4% and African American anglers represented 3%.

CONCLUSIONS

One hundred and four (104) anglers fishing along the lower Fox River were interviewed for the purpose of characterizing their fish consumption habits and their knowledge of the fish health advisory. Study results indicate that most anglers (83%) do not eat the fish they catch, but practice "catch and release." Results also indicate that Asian anglers eat more fish than other groups and that most Asian anglers are not aware of the risks of eating contaminated fish. Also, the public method of communicating the health risk of eating fish from the Fox River is ineffective, as most people have stated they acquire their information through secondary sources such as local newspapers and TV. This study confirms the results of a similar study done on the Lower Fox River in 1998.[4]

Eating fish forms a regular part of the diet and culture for the Asians (Hmong and Laotians) living in the Green Bay area. White Bass, listed in the advisory as "Do Not Eat," appears to be their fish of choice. Although the number of Asian anglers fishing along the Fox River decreased after being informed by the interpreter that White Bass is not safe to eat, there is concern that some of these anglers still may be eating White Bass caught from other nearby contaminated waters. Many Asian anglers may not understand the fish advisory because of the language barrier or may not believe the fish advisory because no immediate physical ill effects have been observed from eating contaminated fish.

This assumption is evidence that there is a need to design culturally sensitive approaches to disseminate information to the Asian community about the health risks of eating contaminated fish. As a result of the survey, the Division of Public Health developed a fish advisory brochure specific to the Fox River. The brochure uses visual materials such as drawings of fish to identify those that are safe to eat, a diagram on properly preparing fish for a meal, and a flow chart educating the reader about PCBs and how they get into the body. Also fish advisory signs written in Hmong as well as in English have been posted at fishing sites along the Lower Fox River. These signs give information about which fish are safe to eat and how to reduce the amount of PCBs in a fish meal by properly trimming the fat.

Figure 3. Knowledge of Fish Advisory, n=103

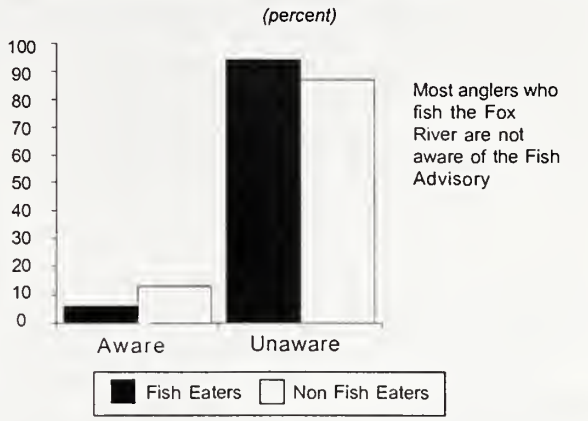
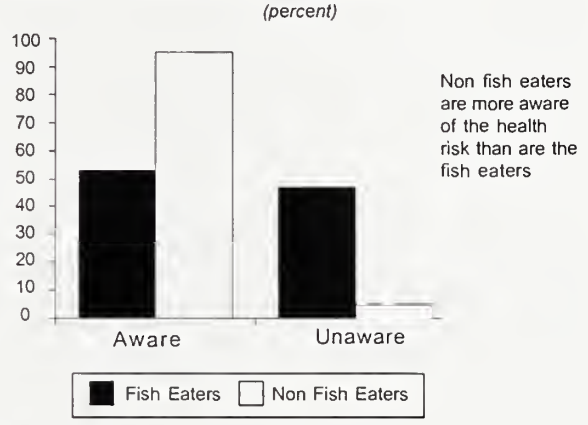


Figure 4. Knowledge of Health Risk, n=103



The study also indicated that the majority of the anglers were male. Although the majority of the anglers interviewed reported that they had heard about the health risks of eating contaminated fish, this message may not be getting to those who are most at risk including pregnant women, women of childbearing age and children Research has shown that awareness of the health risks is especially low among women.[5] This proposes a need to develop strategies to increase their awareness. One suggestion for increasing awareness in women might be to distribute information about the health risks of eating fish in places that women patronize such as maternity care clinics and regular care clinics and grocery stores. Another suggestion would be to integrate the information into the science curriculum at grade and high schools.

Although most anglers are aware of the health risks of eating contaminated fish from the Fox River, the majority of the anglers are not aware of the fish advisory published by the WDNR and WDHFS. This advisory cautions people which species of fish to limit or avoid eating from lakes and rivers in Wisconsin and is available at local DNR offices, state parks and on-line

at www.dnr.state under "Go to some top topics/Fish Consumption Advisories." However, many anglers may not have access to the advisory distributed in these ways. Expanded ways of increasing awareness of the advisory should be looked at. This could include mailing advisories with fishing licenses, distributing advisories at all places where fishing licenses are sold, and broadcasting fish advisories of local lakes and rivers on TV and radio stations.

ACKNOWLEDGMENTS

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Ozone and Particulate Matter Air Pollution in Wisconsin: Trends and Estimates of Health Effects

Daniel A. Daggett, PhD; Jeffrey D. Myers, MS; Henry A. Anderson, MD

ABSTRACT

Objectives: Ozone and particulate matter 10 microns in diameter or less (PM_{10}) are associated with increased risk of morbidity and mortality. This paper will report ozone and PM_{10} trends in Wisconsin and provide estimates of potentially susceptible populations and adverse health outcomes associated with current levels of these pollutants.

Methods: Ozone and PM_{10} monitoring data is provided by Department of Natural Resources (DNR) air monitors. Exposure-response modeling and data, provided by the United States Environmental Protection Agency (US EPA), was used to estimate hospital admissions associated with ozone and PM_{10} pollution.

Results: Days with high ozone concentrations have become less frequent and the annual PM_{10} levels have decreased over the 1990s. However, the potentially susceptible population has increased, the number of children who could experience a lung function decrement due to ozone is between 12,978 and 38,653, and high PM_{10} concentrations are estimated to have resulted in 43 hospital admissions.

Conclusion: Despite decreasing ozone and PM_{10} levels, the burden of respiratory and cardiovascular disease affected by these pollutants remains significant.

INTRODUCTION

Two of the most important air pollutants affecting respiratory and cardiovascular health are ozone and particulate matter. Clinical and epidemiological studies have shown that increased concentrations of these pollutants result in lung function decrements and increased morbidity and mortality due to respiratory and cardiovascular disease.[1,2]

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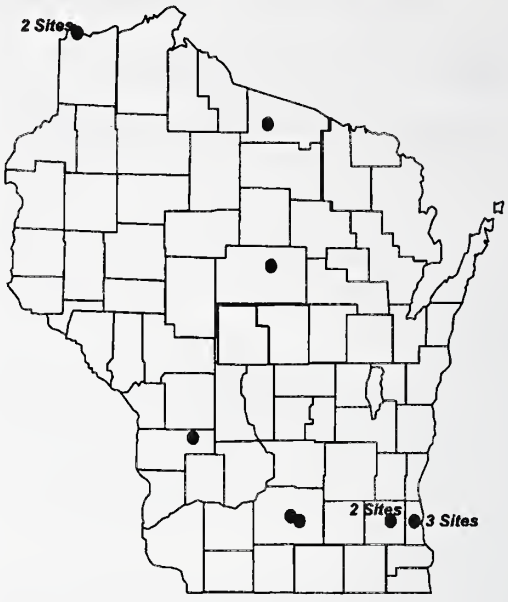
Ozone is a colorless, reactive form of oxygen that damages the respiratory tissues through a process of oxidation, with subsequent inflammation and infiltration of immune cells. Exposure can cause bouts of wheezing, chest tightness and cough. Ozone has also been shown to enhance allergic responsiveness.[3] Some studies have suggested that ozone can cause increased bronchial hyperresponsiveness in persons with asthma.[4] Healthy persons exposed to 80 parts per billion (ppb) ozone for 6.6 hours exhibit lung function decrements.[5] The US EPA ozone standard is currently 120 ppb averaged over one hour. An 8-hour averaged standard of 80 ppb has been proposed by the US EPA due to evidence that longer exposures to ozone levels below 120 ppb could negatively affect lung function. For the remainder of this paper, an incident where the ozone levels exceed a 1-hour average above 120 ppb, or an 8-hour average above 80 ppb, will be referred to as an ozone exceedance.

Particulate matter (PM) is made of particles that vary in size, shape and physical and chemical composition. PM can comprise solids, solid particles with associated liquid or liquid droplets. The chemical composition of PM can include, but is not limited to, nitrates, acidic aerosols, hydrocarbons, sulfates and elements such as heavy metals and minerals. Studies of laboratory animals indicate that exposure to PM can cause increased airway resistance, decreased clearance and pathological changes of the lung.[6] Clinical studies of human volunteers have shown lung function decrements and increased respiratory symptoms following exposure to PM. Epidemiological data has demonstrated an association between human exposure to PM and increased mortality due to cardiopulmonary disease and increased hospitalizations for respiratory and cardiovascular disease.[2,7,8]

The current US EPA particulate matter regulations are focused on particles in the size range of 10 microns or less in size, referred to as PM_{10}. In 1997, EPA proposed a new PM standard based on particles in the size range of 2.5 microns or less, referred to as the $PM_{2.5}$ or PM fine standard. The fine particulates can penetrate deeper into the lung than PM_{10}, and some data suggests

Figure 1. Ozone Monitoring Stations

Figure 2. Wisconsin PM10 Monitoring Sites – 1998



that the health effects associated with particulates might be more closely related to $PM_{2.5}$. However, since there are only a few monitors in Wisconsin and there is little historical information on past $PM_{2.5}$ levels, this paper will focus on PM_{10}.

In Wisconsin, industrial processes, combustion of wood and fossil fuels, transport from other states, and biogenic sources contribute to the levels of ozone and PM. Over a billion pounds of particulates and ozone precursors are released into Wisconsin's air each year. Under Wisconsin law, the responsibility to monitor and protect the quality of the state's air resource is delegated to the DNR. That agency's Bureau of Air Management maintains several air monitoring stations that are located throughout the state to determine compliance with the US EPA's air quality standards.

In addition to monitoring the levels of ozone and PM_{10}, federal and state programs exist to reduce the levels of these pollutants. Controls such as vehicle inspection and maintenance, vapor recovery systems at gasoline terminals and stations, use of cleaner burning engines and fuels, and better fuel economy are central to the control of mobile source emissions of both PM_{10} and ozone precursors. In addition, controls of industrial emissions and voluntary measures such as "Ozone Action Days" have played an important role in reducing emissions. At the regional and national level, other states are reducing emissions resulting in decreased transport of ozone precursors into Wisconsin. Levels of ozone precursors in Wisconsin have dropped by 24% over 1990 levels and future plans include an additional 24% reduction in nitrogen oxide emissions, which are also ozone precursors.

Since air pollution control measures can impose huge economic and social costs, evidence of the potential for effects on human health or the environment is necessary to justify air quality regulations. Monitoring data collected in Wisconsin provides the opportunity to track the trends of ozone and PM_{10} to determine if pollution control programs are working and allows identification of populations who may be at risk. In 1992, Goldring and Morris [9] reported that the population potentially susceptible to the effects of ozone in Wisconsin could be as high as 268,000. The purpose of the current study is two-fold: 1) examine the trends of ozone and PM_{10} in Wisconsin to assess the progress of air pollution controls; and 2) provide a current estimate of the potential for adverse health outcomes associated with these pollutants in Wisconsin.

METHODS

Ozone and PM_{10} data collected at DNR monitoring stations was quality assured and provided by the DNR and the US EPA Aerometric Information Retrieval System (AIRS) program. Ozone monitors run continuously and the data are aggregated into hourly values or averaged over 8 hours. The PM_{10} monitoring is conducted by drawing a known volume of air through a filter that traps particles 10 micrometers or less in size and then weighing the filter. The PM_{10} monitors do not run continuously, but data is collected every 3 or 6 days (sites that have recorded elevated levels of PM_{10} are sampled every 3 days). The available ozone data included years 1986 to 1999; the available PM_{10} data was 1989 to 1999. The number of exceedances per year for ozone and annual mean concentrations statewide for PM_{10} were plotted to illustrate the trends.

The population potentially susceptible to the health effects of ozone in Wisconsin was calculated according to the method of Goldring and Morris.[7] Briefly, the Wisconsin Division of Health Care Finance, Bureau of Health Information provided the 1998 county population estimates, the 1995 National Health Interview Survey provided estimates of the prevalence of asthma and chronic obstructive pulmonary disease (COPD), and the Wisconsin Behavioral Risk Factor Survey was used to estimate the number of people who work or exercise outdoors.

According to US EPA estimates, children playing outdoors are the highest risk category for the effects of ozone exposure. Risk estimates developed for children playing outdoors indicate that 4.6% – 13.7% of the children playing outdoors in areas that "just attain" the current ozone standard will experience a 15% decrement in forced expiratory volume in one second (FEV_1).[1] Children in non-attainment counties as well as counties where an ozone exceedance had occurred between 1995 and 1999 were included in the analysis of the range of children in Wisconsin estimated to be at risk to experience a 15% decrement in FEV_1.

The US EPA has calculated a risk estimate to predict the contribution of PM_{10} exposure on respiratory and cardiovascular hospital admissions.[2] According to their model, a 24-hour averaged increase of 50 µg/m^3 PM_{10} contributes to 6.2 hospital admissions in a population of 1 million. To estimate the burden of PM_{10} exposure in Wisconsin, hospital admissions associated with PM_{10} were calculated by identifying days where the PM_{10} levels were at least 50 µg/m^3 higher than the annual mean at the same monitor. The number of estimated hospital admissions was then calculated for each incident.

RESULTS

The ozone and PM_{10} monitoring stations are shown in Figures 1 and 2, respectively. There are 37 ozone monitors located primarily in southern and eastern Wisconsin. There are 13 PM_{10} monitors in Dane, Douglas, Marathon, Milwaukee, Vernon and Waukesha counties.

The trends for ozone and PM_{10} are shown in Figures 3 and 4, respectively. The yearly frequency of 1-hour averaged ozone exceedances from 1986 to 1999 reveals a downward trend. In Figure 3, an ozone exceedance day is a 24-hour period with at least one 1-hour ozone average above 120 ppb somewhere in Wisconsin. The highest number of ozone exceedance days was 29 in 1988. In 2000, there have been no 1-hour ozone exceedance days. The PM_{10} annual arithmetic mean concentrations from 1989 to 1999 also exhibit a downward trend. The highest statewide PM_{10} annual arithmetic mean was 30.3 µg/m^3 in 1990. The 1999 value was 20.9 µg/m^3.

Figure 3. Number of days with one-hour ozone levels above 120 ppb in Wisconsin (1986–1999)

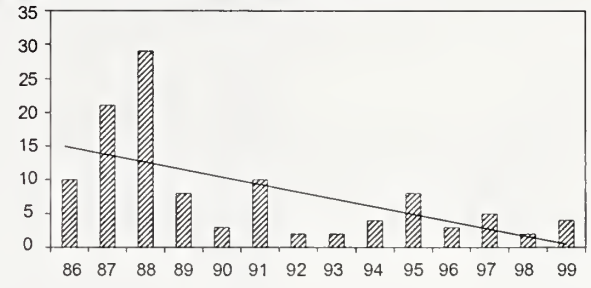
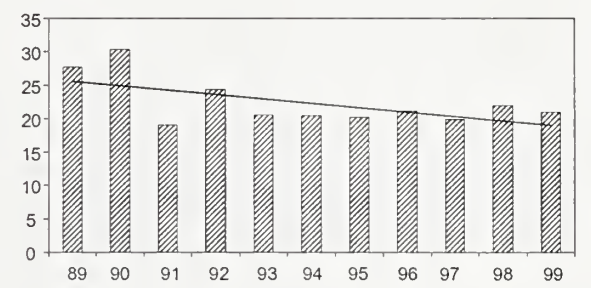


Figure 4. Annual PM_{10} Arithmetic Mean in Wisconsin (1989–1999)



Although the yearly frequency of ozone exceedance days has exhibited a decreasing trend from 1986 to 1999, there has been an increase in the at-risk population potentially susceptible to respiratory problems due to residing in areas of Wisconsin where ozone exceedances occur. Goldring and Morris estimated that between 64,007 and 268,757 people were potentially susceptible to health effects of ozone exposure in eastern Wisconsin, using 1987 – 1991 ozone data.[9] Current population and ozone data reveals that the at-risk population potentially susceptible to ozone in Wisconsin has increased to between 87,813 and 408,857 (data not shown). The roughly 50% increase in persons potentially susceptible is due to increased population in counties, and the addition of Brown, Outagamie, and Rock counties, which have recorded one or more ozone exceedance days from 1995–1999 (data not shown).

Over 700,000 Wisconsin children live in counties that have had an ozone exceedance between 1995–1999. According to the US EPA risk estimate, between 4.6% – 13.7% of the children playing outdoors in areas such as these are at risk to experience a decrement in FEV_1 of at least 15%.[1] Assuming that 40% of children in these counties play outdoors daily during the ozone season, between 12,978 and 38,653 children are estimated to experience a 15% reduction in FEV_1 when an ozone exceedance occurs (Table 1). Higher ozone levels, longer exercise periods and more intense exercise could increase the number of children affected and the severity of the lung function decrement.

Table 1. Children in Wisconsin Counties Estimated to Experience at Least One 15% Decrement in FEV_1 Due to Ozone (1995-1999)

County	Total Children	Outdoor Children	Range of Children Estimated to Have 15% Decrement in FEV1
Brown	53,380	23,352	1,074 – 3,199
Door	6,060	2,424	111 - 332
Kenosha	39,390	15,756	724 – 2,158
Kewaunee	5,050	2,020	92 – 276
Manitowoc	21,120	8,448	388 – 1,157
Milwaukee	256,710	102,684	4,723 – 14,067
Outagamie	42,640	17,056	784 – 2,336
Ozaukee	20,930	8,372	385 – 1,146
Racine	50,420	20,168	927 – 2,763
Rock	39,720	15,888	730 – 2,176
Sheboygan	27,980	11,192	514 – 1,533
Walworth	21,080	8,432	387 – 1,155
Washington	29,860	11,944	549 – 1,636
Waukesha	91,010	34,404	1,582 – 4,713
Total	705,350	282,140	12,978 – 38,653

Table 2. Number of Respiratory or Cardiovascular Hospital Admissions Estimated to be Attributed to PM_{10} (1995 – 1999).

County	Year of Incident	Annual Average (mg/m^3)	Incident Level (mg/m^3)	Estimated # of Hospital Admissions
Dane	1998	27.2	113	4
Douglas	1997	17.1	71	1
Marathon	1995	28.8	115	1
	1995	28.8	82	1
	1996	24.8	78	1
Milwaukee	1998	28.0	79	6
	1999	27.0	240	25
Waukesha	1995	27.6	78	2
	1997	27.2	85	2
				Total = 43

From 1995 to 1999 there were nine occasions in Wisconsin where a PM_{10} monitor recorded levels at least 50 mg/m^3 higher than the annual average at that site. According to the US EPA estimate, an increase of 50 $\mu g/m^3$ PM_{10} averaged over a 24-hour period results in 6.2 hospital admissions in a population of 1 million due to respiratory and cardiovascular effects.[2] Using this estimate, the nine PM_{10} excursions in Wisconsin resulted in approximately 43 hospital admissions (Table 2). Many of these hospital admissions are thought to occur between 1 and 5 days after the PM_{10} excursion.

DISCUSSION

Wisconsin's air quality improved steadily during the 1990s. Ozone and PM_{10} levels exhibit a trend toward decreased frequency of exceedances and lower concentrations overall. The monitoring data indicates that current control programs have been effective. However, despite the improvement in air quality, our estimates indicate that an increase of potentially susceptible individuals has occurred since the report by Goldring and Morris in 1992.[9] This is due in part to a higher prevalence of asthma in the population and an increase in the overall population in areas of Wisconsin that continue to have significant ozone and PM_{10} levels. The primary cause of the estimated increase in population at risk for the effects of ozone is the detection of at least 1 ozone exceedance day in Brown, Outagamie and Rock counties from 1995 to 1999. Thus, the burden of adverse effects on those with respiratory and cardiovascular disease due to these pollutants remains significant.

The downward ozone and PM_{10} trend is a result of concerted efforts at the state, regional and national levels to control sources of these pollutants. Levels of ozone precursors have dropped by 24% over 1990 levels, and the state is currently working on plans for achieving a 24% reduction in nitrogen oxide emissions, which are also ozone precursors. Future federal and

state requirements for mobile sources ("on road," as well as "off road" engines) are aimed to reduce emissions of ozone precursors and PM_{10} even further.

The Wisconsin Department of Health and Family Services (DHFS) identifies and tracks diseases and conditions related to environmental exposures. Unfortunately there are very few diseases which do not have multi-factorial causation. Most commonly, environmental exposures aggravate or compound existing disease. One important category of environmental exposures is ambient air pollution, such as ozone and particulate matter. The role of such exposures as primary causes of respiratory disease continues to be a research priority. What is better understood is the role of these agents as triggers for acute respiratory and cardiovascular episodes. A review of the ambient air monitoring data indicates that ozone and PM_{10} can reach levels of health concern in areas of Wisconsin for limited time periods. The possible health outcomes from these episodes include lung function decrements in healthy persons, worsening asthma conditions or acute attacks, and respiratory and cardiopulmonary distress of other persons with pre-existing conditions such as emphysema and chronic obstructive pulmonary disease (COPD). Recent analysis of asthma hospitalizations in Wisconsin (*see article by Fiore, et al, page 52*) indicates that asthma is a significant, growing public health problem, especially for children in Milwaukee County where ozone and PM_{10} levels have been higher than the state average.[10] Studies that will look for direct correlation between increased ambient air pollution and hospital admissions in Wisconsin are currently being planned by the DHFS.

While primary prevention through pollution control is the goal, informed, at-risk individuals can take action to minimize the potential impact of peak pollution episodes. The public health community supports public information programs to alert at-risk groups to periods of risk and to provide risk reduction advice. To that end, the Wisconsin DNR issues "Ozone Alert" warnings during the summer when forecasting predicts ozone could reach unhealthy levels. These warnings are released prior to the expected problem day and offer the opportunity for at-risk individuals to make plans to avoid exposure to high levels of ozone and be prepared for the possibility of health effects. The warnings also help control ozone pollution by requesting Wisconsin citizens to change driving, refueling and other activities that can affect local ozone levels.

In addition, the Wisconsin DNR has established an air quality index for the PM_{10}, ozone and other criteria pollutants. The air quality index can inform health care providers, parents and at-risk individuals to help them make choices about their level of exposure to air pollution on certain days when the index is above 100. The daily air quality index for southern and eastern Wisconsin can be heard by calling 1.800.242.4727 or on the Internet at http://www.dnr.state.wi.us/org/aw/air/ozone/OzActionNotice.htm.

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Asthma Hospitalizations in Wisconsin: A Missed Opportunity for Prevention

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ABSTRACT

Asthma is the most common chronic disease of children and the third leading cause of preventable hospitalizations in the United States. To assess the impact of this disease on Wisconsin, we examined 1996-1998 statewide and county-specific asthma hospitalization rates and compared these rates to Wisconsin 1990-1992 rates, national rates, and United States Healthy People 2010 asthma target objectives. Wisconsin's average asthma hospitalization rate has decreased from 13.4/10,000 during 1990-1992 to 12.1/10,000 during 1996-1998. Wisconsin children 0-4 years of age had the highest asthma-related hospitalization rate (38.0/10,000) of all age groups, during 1996-1998. Wisconsin African American residents had an average asthma hospitalization rate 6.6 times higher than whites (58.5 vs. 8.8 per 10,000, respectively) during 1996-1998. Milwaukee County had the highest county-specific asthma hospitalization rate in the state (26.4/10,000). Unless significant reductions are achieved, Wisconsin will not reach the Healthy People 2010 target objectives. Interventions should be directed to preventing asthma hospitalizations, especially among Wisconsin's youth and African American population.

INTRODUCTION

It can happen any time, anywhere in Wisconsin. Someone, often a child, comes to the emergency department with shortness of breath, audible wheezing and a look of terror on his face. This patient has asthma and is in the middle of a severe exacerbation. Pulse oximetry documents hypoxia. After emergency treatment with oxygen, a short-acting beta2-agonist, and a bolus of I.V. steroids, the patient is hospitalized. Fortunately, the patient survives and is discharged a few days later. This hospitalization, however, represents a failure of our health care system, a missed opportunity for prevention. To prevent these hospitalizations, appropriate primary care is essential.[1]

Asthma, a chronic inflammatory disease of the airways, is the most common chronic disease of children[2] and the third leading cause of preventable hospitalizations overall in the United States.[1] The economic costs are substantial -- about $26 million is spent annually in Wisconsin for asthma hospitalizations. Wisconsin, like the rest of the nation, is in the middle of an asthma epidemic with an estimated 7% of adults and 9% of children reporting that they have been told by a doctor that they have asthma.[3] National data show a 75% increase in the self-reported asthma prevalence rate from 1980 to 1994 and a doubling of the asthma mortality rate from 1975 to 1995.[4]

In a 1994 *Wisconsin Medical Journal* article, the Wisconsin Division of Public Health reviewed the public health implication of asthma in Wisconsin and highlighted that Wisconsin was experiencing an asthma epidemic similar to that observed nationally. That report indicated that while the overall Wisconsin population had achieved the national Healthy People 2000 asthma hospitalization objectives, African Americans still had rates that exceeded these goals. Much has been learned and some programs have been implemented since the 1994 report. With the adoption of the Healthy People 2010 goals for the nation, it is time to reassess the status of asthma in Wisconsin and to learn if progress has been made since the 1994 article.

METHODS

To assess the impact of asthma in Wisconsin, we examined asthma hospitalization rates for the state as a whole and for each county. We compared Wisconsin 1996-1998 rates to 1996 national rates and the United States Healthy People 2010 asthma objectives. To assess change over time, we also compared Wisconsin 1996-1998 rates to Wisconsin 1990-1992 rates and to the 1991 national rates.

To review Wisconsin hospitalizations attributable to asthma, we analyzed Wisconsin hospital discharge data for admissions during two periods: July 1, 1990 to June 30, 1992 and January 1, 1996 to December 31, 1998. The first period dates were chosen to match the data used in the 1994 reviews.[5] Since 1989, Wisconsin has required hospitals to reports all discharges to the Division of Health Care Financing, Bureau of Health Information. Hospitalizations considered attributable

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to asthma were those admissions with ICD-9-CM-493 listed as the primary discharge diagnosis.

We calculated Wisconsin average asthma hospitalization rates for two periods, 1990–1992 and 1996-1998, and stratified these rates by race, gender, age and county. The numerator for these rates was the number of asthma hospitalization events, not the number of persons hospitalized. Hospitalization events are not necessarily independent (i.e., one person may have multiple asthma hospitalizations during a given year). The denominator for these rates was the Wisconsin population as estimated by the US Census Bureau for the years 1990, 1991, 1992, 1996, 1997 and 1998. Summary rates for Wisconsin were age-adjusted using the direct method and the year 2000 US standard population. All asthma hospitalization rates are reported as hospitalization per 10,000 population. All analyses were done using SAS (SAS Institute, Cary, NC).

We compared 1996-1998 Wisconsin asthma hospitalization rates to national rates, national goals and earlier Wisconsin and national rates. First, we compared Wisconsin rates to United States 1996 age-specific and age-adjusted (stratified by race and gender) rates provided by the Centers for Disease Control and Prevention (CDC).[6] These national rates were based on National Hospital Discharge Survey data. Wisconsin and United States age-adjusted and age-specific rates were based on five age groups: 0-4 years, 5-14 years, 15-35 years, 35-64 years, and 65+ years. Again, all rates were age-adjusted using the direct method and the year 2000 standard population. With respect to hospitalization rates by race, race data were missing for 3% of Wisconsin asthma hospitalizations and 15% of the sample from the National Hospital Discharge Survey. We excluded these subjects from the race-specific rate calculations, but included them in all other rate calculations.

The second comparison we made was between the average annual Wisconsin asthma hospitalization rates (1996-1998) and the United States Healthy People 2010 asthma target objectives.[7] For this comparison, Wisconsin and United States age-adjusted and age-specific rates were based on three age groups: 0-4 years, 5-64, and > 65. As above, rates were age-adjusted using the direct method and the year 2000 United States standard population.

The final comparison we made was between average annual Wisconsin hospitalization rates in 1996-1998 and in 1990-1992. To put these time trends in context, Wisconsin asthma hospitalization rates were also compared to the United States rates for both 1991 and 1996.

RESULTS

A total of 18,648 asthma-related hospital admissions occurred in Wisconsin during 1996–1998, with an overall age-adjusted rate of 12.1 per 10,000 (Table l).

Table 1. Average annual age-adjusted and age-specific hospitalization rates per 10,000 population for asthma as the first-listed diagnosis, by race, sex and age-group. Wisconsin 1990-1992* and 1996-1998, and United States, 1991 and 1996.

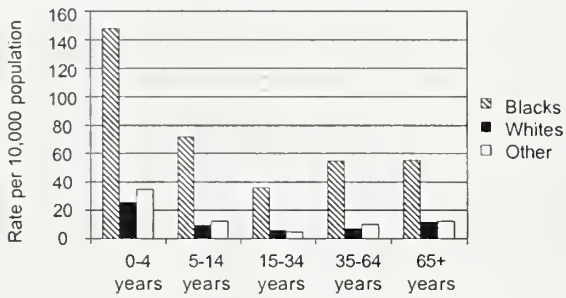
	Wisconsin 1990-1992	US 1991**	Wisconsin 1996-1998	US, 1996**
Race				
White§	9.8	12.9	8.8	10.7
African American§	54.9	27.9	58.5	38.1
Other§	12.7	25.1	10.8	25.5
Sex				
Male§	12.2	17.8	10.2	14.4
Female§	14.3	21.0	13.7	20.5
Age group (years)				
0-4	40.4	56.7	38.0	56.9
5-14	17.3	22.3	15.2	21.1
15-34	7.8	9.2	8.1	9.4
3 5-64	9. 5	16.4	8.9	15.3
>65	17.9	28.7	12.6	17.3
Total§	13.4	19.6	12.1	17.7

* 1990-1992 data are based on admissions from July I, 1990 to June 30, 1992. The Wisconsin 1996-1998 and US 1991 and 1996 data are based on admissions during the calendar years.

**Source: US Centers for Disease Control and Prevention, National Center for Environmental Health, Air Pollution and Respiratory Health Branch[6]

§ Age-adjusted to the 2000 United States standard population

Figure 1. Average annual age-specific asthma hospitalization rates by race, Wisconsin, 1996–1998



Wisconsin's children ages 0-4 years had the highest asthma-related hospitalization rate of any age group at 38.0/10,000. Wisconsin African Americans had asthma hospitalization rates six times higher than whites (58.5 vs. 8.8 per 10,000, respectively), with this racial difference present across all age groups. Wisconsin's black children 0-4 years had rates six times higher than white children (147.9 vs. 25.9 per 10,000, respectively) (Figure 1).

Overall, Wisconsin females had a slightly higher asthma hospitalization rate than Wisconsin males in 1996-1998 (13.7 and 10.2 per 10,000, respectively) (Table 1). Further examination of gender-specific rates stratified by age showed that young males (age <14

Table 2. Average annual age-adjusted asthma hospitalization rates per 10,000 by county, Wisconsin, 1996-1998.

County	Asthma Admissions	Population 1996-1998	Age Adjusted Rate
Adams	47	54,518	9.8
Ashland	60	49,584	12.1
Barron	111	130,803	8.5
Bayfield	61	45,365	13.5
Brown	555	642,080	8.7
Buffalo	17	42,670	3.8*
Burnett	56	43,576	12.2
Calumet	80	113,918	7.4
Chippewa	206	162,977	12.6
Clark	86	99,033	8.3
Columbia	129	151,489	8.6
Crawford	43	49,575	8.3
Dane	1231	1,262,132	10.1
Dodge	242	246,957	9.9
Door	49	80,761	6.1
Douglas	23	129,018	1.8
Dunn	84	116,154	7.6
Eau Claire	199	267,137	7.6
Florence	2	15,664	1.3*
Fond Du Lac	168	283,319	5.9
Forest	23	28,717	7.7
Grant	62	148,118	4.2
Green	92	99,194	9.2
Green Lake	41	58,197	7.1
Iowa	41	66,439	6.0
Iron	4	19,251	2.0*
Jackson	65	52,633	12.4
Jefferson	208	219,912	9.6
Juneau	76	71,495	10.3
Kenosha	437	428,470	10.2
Kewaunee	22	59,037	3.8
La Crosse	271	306,726	9.0
Lafayette	24	49,149	4.7
Langlade	52	61,469	8.5
Lincoln	79	88,581	8.8
Manitowoc	226	246,785	9.1
Marathon	244	366,981	6.7
Marinette	115	128,650	9.1
Marquette	25	44,426	5.5
Menominee	20	14,211	14.2
Milwaukee	7250	2,756,852	26.4
Monroe	70	117,768	5.9
Oconto	57	100,248	5.7
Oneida	118	106,642	11.7
Outagamie	261	463,020	5.7
Ozaukee	161	241,752	6.8
Pepin	9	21,357	4.0*
Pierce	68	105,628	6.9
Polk	99	114,830	8.6
Portage	145	193,981	7.9
Price	24	47,443	4.9
Racine	698	555,891	12.6
Richland	52	53,664	9.4
Rock	516	450,917	11.5
Rusk	31	45,877	6.6
Sauk	112	158,517	7.2
Sawyer	46	48,069	9.5
Shawano	109	115,631	9.3
Sheboygan	414	329,371	12.7
St Croix	132	172,409	8.0
Taylor	31	57,844	5.0
Trempealeau	54	78,991	6.5
Vernon	78	81,818	9.3
Vilas	41	63,066	6.5
Walworth	169	252,740	6.9
Washburn	43	45,778	9.4
Washington	271	337,817	8.1
Waukesha	881	1,044,914	8.7
Waupaca	120	150,324	7.9
Waushara	58	64,302	8.8
Winnebago	327	448,605	7.5
Wood	218	227,837	9.6
Wisconsin	18,648	15,596,187	12.1

*Rates based on less than 20 admissions are considered unstable.

years) had higher asthma hospitalization rates than females (data not shown). After age 14, however, females had asthma hospitalization rates about twice as high as males.

Of all Wisconsin counties, Milwaukee had the highest asthma hospitalization rate at 26.4/10,000 in 1996-1998, followed by Menominee at 14.2/10,000 and Bayfield at 13.5/10,000 (Table 2). The three counties with the lowest asthma hospitalization rates were Florence (1.3/10,000), Douglas (1.8/10,000), and Iron (2.0/10,000). The Florence County and Iron County rates, however, were based on a small number of hospitalizations. The southeastern quadrant of the state had the greatest number of counties with hospitalization rates in the top 25th percentile (Figure 2.)

Between 1990-1992 and 1996-1998, overall Wisconsin asthma hospitalization rates declined 9.7% from 13.4 to 12.1 per 10,000 (Table 1). The rate among African Americans increased 6.6 % (from 54.9 to 58.5 per 10,000), while the rates among whites and other races decreased (10% and 15%, respectively). When examining rates of asthma hospitalizations between 1990-1992 and 1996-1998 by age, people aged 65 years and older had the greatest change with a 29.6% decrease (17.9 to 12.6 per 10,000). With respect to change by gender, the decrease in the rates for females was not as great as that seen for males (4% vs. 16%, respectively). In contrast, over the five years from 1991 to 1996, the overall US asthma hospitalization rate also declined 9.7 percent from 19.6 to 17.7 per 10,000 (Table 1). With respect to the United States Healthy People 2010 asthma target objectives, Wisconsin has some room for improvement (Table 3), particularly in terms of asthma hospitalizations among children under 5 years of age. Wisconsin's 1996-1998 rate for children under 5 is 38.0/10,000, while the national 2010 target is 25/10,000.

DISCUSSION

While overall asthma hospitalization rates in Wisconsin have decreased since 1992, asthma continues to exact an enormous toll on the health of Wisconsin residents, especially children. Moreover, there is the disturbing preponderance of African Americans hospitalized with asthma – during 1996-1998 the asthma hospitalization rate among Wisconsin African Americans was 6.6 times higher than that of whites. Moreover, this racial difference has increased since 1992 (5.6 times higher in 1990-1992 vs. 6.6 times higher in 1996-1998). Finally, the racial difference in asthma hospitalization rates in Wisconsin is greater than the racial difference reported nationally. In 1996, the United States black asthma hospitalization rate was about 3.5 times greater than that seen among whites.

Racial factors also appear to have influenced Wisconsin county-specific asthma hospitalization rates. The southeastern quadrant of the state had the greatest

number of counties (8) in the upper 25th percentile of asthma hospitalization rates. Five of these counties (Milwaukee, Racine, Dane, Rock and Kenosha) are also the top 5 counties with respect to the number of black residents. In Milwaukee County specifically, while African Americans account for about 24% of the population, they represent about 60% of asthma hospitalizations. Milwaukee County has the greatest number of African Americans in the state and ranks second (trailing Menominee County) in the percent of people estimated to be living in poverty.[8]

The racial differences in Wisconsin asthma hospitalization rates represent an exaggeration of the differences observed in the national data and published studies. It is well established that racial/ethnic minorities who are poor and reside in inner cities are the highest risk population for asthma morbidity. The explanation for this difference in risk is unclear and may result from a complex mix of factors: poverty and its implications, access to and under utilization of outpatient health services, biologic and genetic factors, and exposure to high levels of allergens and irritants in the home and outdoor environment.[9,10,11]

Asthma hospitalizations are also a marker of inadequate primary care for asthma. Inadequate primary care is especially striking in urban minority populations. In a recent study, Rand and colleagues[12] concluded that asthma management for children in the inner city relies on episodic care and emergency care and that asthma medication management does not conform to current guidelines. In Wisconsin, HMO Medicaid data show that asthmatic HMO enrollees residing in Milwaukee County are hospitalized about twice as often as those residing elsewhere in the state.[13] A 1997 review of Wisconsin asthma hospitalizations among residents aged less than 25 years showed that 33% of all asthma-related admissions were readmissions.[14] In addition, African Americans were 50% more likely than whites to be readmitted to a hospital for asthma. (The issue of readmissions was not addressed in this current review).

Exposure to asthma triggers in the home and outdoor environments can exacerbate asthma and may result in subsequent hospitalization. Environmental factors are especially striking in homes of the urban poor where environmental tobacco smoke and cockroaches are more prevalent.[15] Further, in a study of central Milwaukee asthmatic children, Brown and colleagues[16] found these children were more likely to demonstrate roach sensitivity than sensitivity to other home allergens (e.g., dust mite, mold). Additionally, this study showed roach allergen sensitivity was positively associated with dust roach allergen levels – the higher the dust allergen level, the greater the sensitivity.

Ozone and particulate matter are two outdoor air pollutants that can exacerbate asthma. Many laboratory and epidemiological studies have demonstrated the adverse pulmonary effects of ozone exposures,[17] and a recent study showed ozone exposure increased subsequent reactivity to other allergens.[18] In Wisconsin, 8 counties (Milwaukee, Racine, Kenosha, Ozaukee, Washington, Waukesha, Manitowoc and Door) currently fail to meet federal ozone standards, according to the Wisconsin Department of Natural Resources. All but 1 of these counties is in the southeastern part of the state. Three of these counties (Milwaukee, Racine and Kenosha) are also in the top 25th percentile for asthma hospitalization rates.

With respect to particulate matter, urban and industrial areas generally have higher concentrations. While particulate matter monitoring is limited to 8 counties statewide, Milwaukee had the highest one-time and third highest average particulate matter levels in the state during 1996-1998.[19] Recent data (*see article by Daggett et al, page 47*) suggests that ozone and particulate matter levels may contribute to elevated asthma hospitalization rates in some Wisconsin counties.

To decrease asthma hospitalizations in Wisconsin, interventions must focus on a number of factors:

1) Increasing physicians' awareness of and adherence to the National Heart, Lung, and Blood Institute's 1997 Practical Guide for the Diagnosis and Management of Asthma;[20]

Figure 2. Average Annual Asthma Hospitalization rates per 10,000 population by county, Wisconsin, 1996–1998

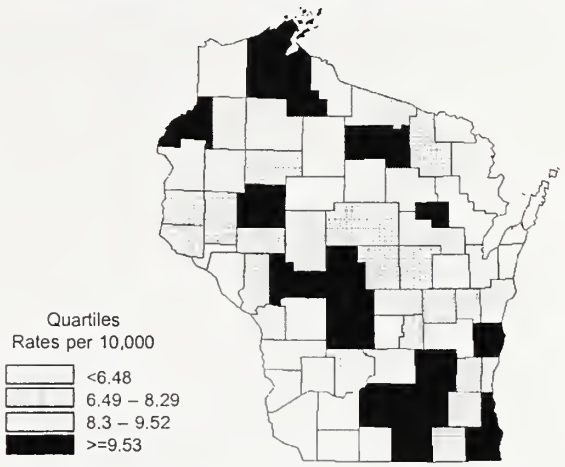


Table 3. Average annual Wisconsin asthma hospitalizations rates per 10,000 population 1996-1998 compared to the United States Healthy People 2010 target objectives.

Age Group	Wisconsin 1996-1998	2010 Target
Children under age 5 years	38.0	25
Children and adults aged 5 to 64 years**	9.7	8
Adults aged 65 years and older**	12.6	10

*Source: Healthy People 2010'
**Age-adjusted to the year 2000 US standard population

2) Increasing access to and routine utilization of outpatient health services for asthma management while decreasing episodic and emergency care;
3) Decreasing exposure to home, school, workplace and outdoor air allergens and irritants; and
4) Increasing the proportion of asthma patients and their families receiving asthma management education.

Since the first review of Wisconsin asthma hospitalization rates 6 years ago, several interventions have been initiated in Wisconsin. To reach physicians, *WMJ* focused on asthma in its May/June 1999 issue. In addition to summarizing such activities as the State Medical Society of Wisconsin's Asthma Outcomes Study and the Pediatric Asthma Study, the Journal provided a stepwise approach to managing asthma in accordance with the 1997 Expert Panel Guidelines. In Milwaukee, the coalition *Fight Asthma Milwaukee* was formed and has undertaken such activities as research, asthma community forums, an annual asthma wellness day, and other asthma education for families. More recently, Children's Health System (John Meuer, MD, project director), *Fight Asthma Milwaukee* coalition members, and other partners have also applied to the Robert Wood Johnson Foundation for funds to improve asthma care for children.

The Wisconsin Department of Health and Family Services (DHFS) has conducted several asthma projects since 1994. Through grants from the CDC, the Department has provided funding to staff the *Fight Asthma Milwaukee* coalition and has conducted asthma surveillance, asthma intervention studies in central Milwaukee, and asthma education for Milwaukee County W-2 participants. These projects were conducted in cooperation with several partners including the *Fight Asthma Milwaukee* coalition, the City of Milwaukee Health Department, the American Lung Association of Wisconsin, Children's Hospital of Wisconsin, the Medical College of Wisconsin, and Sinai Samaritan Medical Center. In addition, the DPH has studied the relationship between asthma and sulfur dioxide exposure in Wood County. More studies are planned to examine associations between outdoor air pollution and respiratory hospitalizations, including asthma.

CONCLUSION

Effective interventions to prevent asthma hospitalizations exist. We have demonstrated that hospitalization data can be used to monitor asthma status and the Wisconsin DHFS will continue to track asthma hospitalizations. While we have made progress in decreasing asthma hospitalization rates, Wisconsin still has far to go, especially in addressing racial disparities. The findings from this paper document a critical public health challenge for Wisconsin this decade – the need to implement asthma management interventions statewide, with renewed effort and special focus on youth and African Americans. In this way, we can more effectively combat this preventable cause of illness and death.

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Philip M. Farrell, MD, PhD

Dean's Corner

Balancing Intervention with Prevention: A Better Mission for the 21st Century

Philip M. Farrell, MD, PhD
Dean, University of Wisconsin Medical School

A year ago, the medical profession was celebrating a century of monumental healthcare advances. We improved the nutritional status of infants and children, took advantage of using antibiotics to treat bacterial infections, virtually eliminated some infectious diseases, invented effective methods of intensive care, transplanted organs from one human to another, and found ways to cure many life-threatening disorders ranging from hypertension to cancer. We were, in effect, able to counter many of those factors in our environment that put large numbers of people at high risk. Considering all the health care advances of the 20th century, the medical profession can rightly claim to have had a profound impact on the lives of our citizens.

Reflecting on our success, it's fair to note that the accomplishments we tend to cite as major advances have been associated with tertiary medical care rather than being preventive strategies. Unfortunately, the fields of public health and medicine began to diverge more than 50 years ago. Public health stopped at the hospital door, and physicians began to see the field of public health as a threat to their authority and a doctor-patient relationship that emphasizes individual care through diagnostic and therapeutic interventions for illness or injury. In contrast, public health has emphasized health promotion and disease prevention in populations at risk.

Through most of the 20th century, academic medicine mirrored the profession's overall emphasis on disease and tended to be isolated from public/population health while remaining focused on finding miracle cures. Medical schools have also featured learning experiences that ensured our students were fully trained in the latest interventional procedures. As we look forward, however, many leaders see the beginning of the 21st century as a time to develop a synergistic partnership between the public/population health and medicine, i.e., shift toward a complementary, balanced strategy with common initiatives.

While some of this shift may be attributed to cost containment imperatives, the change also stems from basic and translational research. Molecular biology research into the human genome has opened a whole new vista for preventive medicine. Advancing incrementally, we are coming to understand how every disease affects cell biology, and eventually we will learn how behavioral, racial, environmental and social factors influence health outcomes. From that understanding and the use of molecular diagnostics and therapeutics, we hope to be able to identify preemptively and then prevent or cure most diseases. Investing in the disciplines of the population health sciences (especially epidemiology, statistics, behavior psychology and sociology) will pay dividends, just as investments in biomedical research by the NIH has paid off with remarkable discoveries.

Modern research is focusing more and more on identifying those factors that contribute to disease. In most cases, we are learning that disease is a combination of genetic and environmental factors. To the extent that we understand those factors, we will be able to intervene, to mitigate for and even eliminate risks for certain populations.

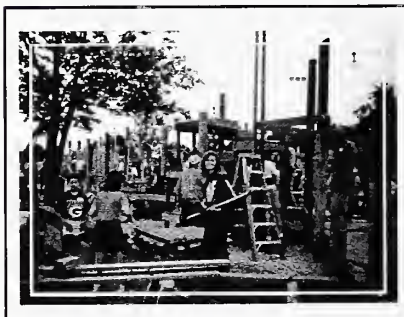
For example, because of research that began 16 years ago in Wisconsin on the benefits and risks of neonatal screening for Cystic Fibrosis, we now accomplish routine early diagnosis of infants who have this genetic disease so that we can provide early interventions that eliminate malnutrition and other problems. Today, researchers at the UW Medical School are studying the childhood origins of asthma, seeking to prove the hypothesis that a combination of a genetic predisposition coupled with a common childhood virus may cause asthma. If this is the case, we have the opportunity to intervene genetically or perhaps

immunize against viruses to effectively prevent the disease's airway manifestations. Thus, for these respiratory disorders, there is a healthy convergence of intervention and prevention that benefits both individuals and populations.

In the future, prevention will occur through a balanced mix of research, education, interventions and lifestyle changes. Medical schools must be prepared to lead in all of those areas and seek more extramural funding for population health initiatives. Toward that end, the UW Medical School is enhancing our Department of Preventive Medicine with additional health education and research programs using a remodeled WARF building to ensure we are at the vanguard of emerging, coordinated programs. This effort is part of the Medical School's Strategic Plan for the 21st Century.

Since the theme of this issue of *WMJ* is environmental health, I want to applaud the University's State Laboratory of Hygiene (SLH), which is headed by Professor Ronald Laessig. In existence since 1903, the SLH has made many major contributions to the health of Wisconsin's citizens. I am sure many of you are familiar with the services the laboratory provides to physicians and other health professionals. The Laboratory also has a major environmental health component. I recently had the opportunity to tour their new Environmental Health Laboratory, and it is quite impressive. Professor William Sonzogni directs this new facility, and he and his staff are good resources for physicians with questions about the link between the environment and human health.

As we look to the next hundred years, the promise of eliminating our most threatening diseases seems inevitably close at hand. Today, our children hardly know the names of many diseases that felled our parents. Their children may well become unfamiliar with the most serious diseases of our time such as cancer and diabetes. Our ability to fulfill this promise, however, rests with our ability to understand the relationship of our internal biology with the environmental exposure systems that surround us. For that, we will need to achieve a synergism between medicine and public health that will produce a balanced health care system for all populations. The ongoing convergence of the medical and population health sciences at the UW Medical School clearly provides us with a better mission for the 21st Century.



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A Systems Approach Works Best for Smoking Cessation

Jay A. Gold, MD, JD, MPH; Judy Frisch, RN, MBA; Shanin Pepple; and Dennis Spurlin

As physicians are well aware, cigarette smoking is the leading preventable cause of illness, disease and death in the United States. It is responsible for more than 400,000 deaths annually, according to the Centers for Disease Control and Prevention. Smoking has strong links to heart disease, cancer, stroke and a variety of respiratory ailments.

Americans spend an estimated $50 billion annually on direct medical care for smoking-related illnesses. Lost productivity and forfeited earnings caused by smoking-related disability account for another $47 billion each year.

In stark contrast, the US Department of Health and Human Services (DHHS) estimates the average per-smoker cost for effective cessation treatment is less than $166. The agency also indicates smoking cessation interventions are more cost effective than other routine medical interventions or preventive practices, such as blood pressure monitoring or mammograms.

Physicians, administrators, insurers and others working in health care face the daily challenge of balancing quality health care against the associated medical costs. An institutional smoking cessation program can provide immediate and significant cost savings by reducing health risks and complications.

The most successful smoking cessation programs are supported by institutional policies. They incorporate reimbursement practices, clinical and systems procedures, incentives for providers and clinician education. The DHSS recommends the following institutional strategies to help health care providers identify and treat tobacco users:

1. Implement a tobacco-user identification system in every clinic.
2. Provide education, resources and feedback to promote provider intervention.
3. Promote hospital and clinic policies that support and provide smoking cessation services.
4. Include smoking cessation treatments as paid services in all health benefits packages.
5. Address effective smoking cessation treatment in clinician compensation agreements.

As part of its work to improve the quality of care for Medicare patients, MetaStar has developed a Smoking Cessation Quality Kit for hospitals. The kit provides institutional smoking cessation information, a guide to helping smokers quit, a reference guide for smoking cessation specialists and other pertinent information. The kit was sent to all Wisconsin hospitals in late summer, and MetaStar's clinical quality specialists are currently contacting institutions for follow-up.

Authors are with MetaStar, Inc. Doctor Gold is Senior Vice President and Principal Clinical Coordinator; Ms. Frisch is Clinical Quality Specialist; Ms. Pepple and Mr. Spurlin are Communications Specialists.

Helping smokers quit

Effective preventive methods are available to greatly reduce the risk of suffering from smoking-related disease. Following are effective guidelines for helping health care providers identify and treat tobacco users.

- Every person who smokes should be offered smoking cessation treatment at every office visit and every hospital admission.
- Hospital staff **should ask and record** the tobacco use status of every patient.
- Cessation counseling, even as brief as three minutes, can be effective.
- The more intense the treatment, the more effective it is in producing long-term abstinence from tobacco.
- Nicotine replacement therapy (nicotine patches or gum), clinician-delivered support and skills training are effective components of smoking cessation treatment.
- Health care systems should be modified to identify routinely and to intervene with all tobacco users at every visit.

Developed by the Agency for Health Care Policy and Research, DHHS

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WMJ

December 2000

An ounce of injury prevention...

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Thomas C. Meyer, MD

Editorial

Injury Prevention Rounds Out Public Health Review

by Thomas C. Meyer, MD, WMJ *Medical Editor*

This issue of *WMJ* is the last in this series of five devoted to reviewing current Public Health issues in Wisconsin. During the course of the year, we have been privileged to obtain an overview of the considerable and diverse responsibilities and achievements of the Division of Public Health (DPH), thanks to a strong partnership with the Division and an overwhelming response from those asked to contribute manuscripts for this project.

One of the most edifying sections in each of these issues has been the primer in the realities of health politics by DPH Administrator John Chapin. He details how things get done in the real world of state proposals, debates, passage (or not), appropriations (or not) and implementation. Throughout, there is the plea that the practicing sector no longer stands aloof from the fray.

Perhaps this particular issue should be sub-titled "The hazards of accidental death and injury while growing up in Wisconsin at the turn of the millennium." Hale (p 10) and Perloff (p 17) give disturbing insights to the personal and societal consequences of ignoring issues that are constantly in the public eye — seat belts, cycle helmets (did you realize that bicycle helmets are twice as effective as motorcycle helmets?), and risk factors of gun ownership (guns may soon cause more deaths annually than motor vehicle crashes!).

Several papers deal with hazards children face at varying ages and exhort those of us who have professional contact with them to include warnings and anticipatory counseling to parents during the well baby/child visits. Tarrago reviews mechanical airway obstruction (p 43); Table 1 identifies the essence of her message. DeMuri and Purschwitz (p 51) review the epidemiology, pathogenesis and prevention of farm injuries in children and adolescents and offer some helpful guidelines for counseling farm families. McIntosh and Moreno's article on the risk factors for fatal injuries and data showing the preponderance of motor vehicle accidents as the leading cause of death in the teenage years provides an appropriate backdrop for her article (p 31) on the recently-enacted Graduated Drivers License (GDL) requirements. A "must-read" for those of us who have teenagers in the house and almost as important for those who don't, so the wool can't be pulled over our trusting eyes by wily teenagers anxious to spread their wings!

Mitchell et al examine motor vehicle-related mortality trends in Wisconsin (p 27). Although overall mortality is down 12%, there is little reason to celebrate among women, non-whites and those over age 75.

Whalen provides us with the epidemiology and prevention of animal bites (along with a list of "gentle dogs" and some tips to pass along to parents and children in avoiding animal bites and encountering strange dogs) (p 39) with the promise that she will address the evaluation and treatment in the near future. Corden and Kazmierczak's companion article (p 47) examines the challenge rabies presents to our healthcare system – particulary timely since a Wisconsin resident was diagnosed with and died of rabies in November.

Some of the community-based programs aimed at the prevention of these disasters are detailed by Peterson and her colleagues (p 22).

We have been gratified by the response to this series, by the additional work put in by the DPH staff and by authors outside the Division who have contributed and allowed us to "catch up" on public health issues in the state. We thank all of them and hope it will be possible to re-visit pieces and parts of their activities in the future.

Meanwhile, we hope authors who have interests in the themes selected for 2001 listed on page 4 of this issue will consider submitting their manuscripts for review and possible inclusion in the *Journal.* And, as always, we look forward to your feedback.

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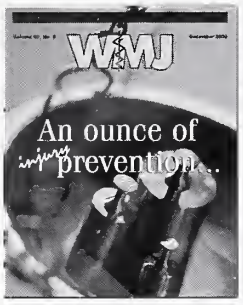

COVER THEME INJURY PREVENTION

Approximately 150,000 people die each year from injury in the United States. Yet many Americans believe that these deaths are inevitable and unpreventable. In this issue of WMJ *we examine some of the injuries that contribute to these statistics, and what can be done to bring the numbers down. An ounce of prevention truly can equal a pound of cure.*

Cover design by Kendi Parvin, *WMJ* Managing Editor

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

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Letter to the Editor

Too Many Treatments for Parkinson's Disease: Yet Another Look

Recognizing that the *WMJ* is not the ideal forum to resolve disagreements between specialists, nevertheless the comments by Dr. Nausieda (*WMJ*, August 2000) on Dr. Reynolds et. al's paper (*WMJ*, June, 2000) contraindicating some antipsychotics such as olanzepine, resperidone and haloperidol in Parkinson's Disease deserve further discussion because they have broad practice implications. The suggestion that such use amounts to malpractice is not entirely correct because, used cautiously and in proper doses, these drugs may be safe and beneficial in selected psychotic patients with Paralysis Agitans and related conditions. As a geriatric neuropsychiatrist practicing in Wisconsin for some time, I have prescribed, and seen prescribed, these drugs with benefit and safety for many patients with neurodegenerative disorders and psychosis who also have late onset Parkinsonian symptoms. In my experience the effective and tolerable dose range is exceedingly low: for example, resperidone 0.25 to 1.0 mg per day. It should also be noted that for mild and non-distressing or self-limiting symptoms, it may be possible to forgo the use of antipsychotics altogether.

The point that antipsychotic drugs generally block dopamine (D2) receptors and so coadministration of antipsychotic with antiparkinson agents creates a competition for the D2 receptor is true. However, all effective antipsychotic agents block D2 receptors; they differ with respect to their dose effect curves and the point on that curve where D2 receptors become 100% saturated. Unfortunately, such information is not available in a straightforward manner to the general practitioner through usual sources such as the Physicians Desk Reference. I was able to obtain comparable information comparing the clinical efficacy of these agents with D2 receptor occupancy using Positron Emission scanning from a neuropsychopharmacologist colleague (H. H. Harsch, personal communication). Based on these data, the relative clinical dose to D2 saturation is clozapine> quetiapine> olanzepine> resperidone> haloperidol. Thus, it is correct to state that clozapine and quetiapine have a higher margin of safety with regard to D2 occupancy in their effective dose range, but it is also true that in low doses other agents can still be effective without completely saturating the D2 receptors. However, clozapine has adverse effects and contraindications which limit its acceptability in many cases, and quetiapine is a relatively new agent which will require some time for its usefulness to be fully appreciated. Therefore, many patients may be better off remaining on treatment with older agents despite their potential limitations.

In time, hopefully soon, there will be effective alternative antipsychotic compounds and protocols for treatment of psychosis and Parkinson's disease; in the meantime it would be inappropriate to deprive patients who benefit from treatment with established agents of that benefit out of excessive fear of harm. It should be noted that my own experience is based primarily on treating or observing geriatric patients with late onset Parkinsonian processes who for the most part have relatively uncomplicated treatment needs. For younger patients and those with severe and complicated neurological symptoms, an even higher degree of care in the selection and titration of antipsychotic and antiparkinsonian agents, including referral to tertiary care resources, may be called for.

Laurens D. Young, MD, Mequon

WMJ

Call for Papers, Reviews, Commentary

The *WMJ* Editorial Board is seeking original manuscripts related to these themes:

Firearms and Injury Prevention (to be printed in March)
Deadline for submissions: January 31

Smoking (to be printed in June)
Deadline for submissions: April 6

Management of Chronic Pain (to be printed in July)
Deadline for submissions: May 11

Patient Safety (to be printed in August)
Deadline for submissions: June 15

Alternative Medicine (to be printed in September)
Deadline for submissions: July 20

End-of-Life Issues (to be printed in November)
Deadline for submissions: August 24

Outcomes Research (to be printed in December)
Deadline for submissions: September 28

In addition, general scientific papers are always appreciated and will be published on a regular basis. All submissions should conform to *WMJ* requirements. For further information contact Kendi Parvin, Managing Editor at 608.257.6781, toll-free at 800.362.9080, or via e-mail at: kendip@wismed.org. Instructions to authors are available on the SMS website at www.wismed.org.

Welcome New Members

The individuals listed below were recently elected to SMS membership by their County Medical Societies. We are pleased to welcome them to the SMS.

Ashland-Bayfield-Iron
Dheeraj K. Raina, MD
Glenn C. Stow, MD

Barron-Washburn-Burnett
Barbara M. Ankarlo, MD

Brown
Philip Goolsby, MD

Chippewa
Stephen F. Carlson, MD

Columbia-Marquette-Adams
Russell Gelfman, MD
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Kevin E. Fehr, MD
Lars Freisberg (S)
Julie M. Kessel, MD
Mindy Kim-Miller (S)
Mihailo Lalich (S)
Samuel T. Nadler (S)
Xiushui Ren (S)
Peter K. Todd (S)

Door-Kewaunee
R. Eric Seward, MD

Eau Claire-Dunn-Pepin
Harpreet K. Bhatia, MD
Peter R. Chambers, DO
Russell L. Durkee, DO
Edward P. Hayes, MD

Fond du Lac
Suhail M. Hairi, MD
Gregory B. Kapala, MD

Kenosha
James E. Tomic, MD

La Crosse
Gregory M. Knorr, MD
Todd J. Kowalski, MD
Richard J. Lusis, MD
Richard Chas Preisman, MD

Manitowoc
John S. Bratteli, MD
Ellyn S. Meshel, MD

Marathon
Matthew T. Clancy, MD
David P. Dillon, MD
Mark J. Schuler, MD

Milwaukee
Ryan A. Holt (S)
Staci L. Kraus (S)
Diana L. Newby (S)
Christopher C. Thompson (S)

Oneida-Vilas
Kim M. Erdmann, MD
Kathy R. Stinson, MD

Outagamie
Amy H. Servais, MD
Lee M. Vogel, MD

Ozaukee
John D. Yadgir, MD

Pierce-St. Croix
Sean P. Flood, MD
Gregory J. Miller, MD

Portage
Jay J. Rusek, MD

Racine
Julie A. DeRosa (S)
Stephen K. Goewey, MD
Lisa S. Graham, MD
Anil Shantilal Patel (S)
William R. Pinkonsly, MD

Rock
George Cherian, MD

Walworth
Robert O. Ong, MD

Waukesha
Claire Louvar, DO

Winnebago
Maria C. Dziamski, MD
Marley L. Kercher, MD
Brian M. Teviotdale, MD

(S) designates medical student membership

Who's in the News

Timothy R. Boyle, MD, otolaryngologist with the Marshfield Clinic, has been admitted into the American Rhinologic Society.

Spine surgeon **Thomas Faciszewski, MD,** Marshfield Clinic, was appointed to the North American Spine Society (NASS) Board of Directors, for which he will serve as the Council of Socioeconomic Affairs director.

Bradley C. Hiner, MD, was elected vice president/president-elect, and Erik K. St. Louis, MD, was elected secretary for the Wisconsin Neurological Society at its October annual meeting.

George E. Magnin, MD, has received the Marshfield Clinic Heritage Foundation award to honor his contributions to the community.

Michael J. Soderling, MD, an OB-GYN physician with the West Bend Clinic, will be leaving for a three-month trip to Guatemala in January. He will be providing medical care at a small clinic in Guatemala City.

Elizabeth Strabel, MD, from Portage, has achieved the degree of Fellow of the American Academy of Family Physicians.

The late **Dean Stueland, MD,** whose impact will be felt for years by researchers and patients, was honored posthumously with the 13th annual Gwen D. Sebold Research Fellowship.

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In Remembrance

Edelblute, Lyle H., MD, 79, of New Franken, passed away October 7, 2000. He earned his medical degree from the University of Kansas School of Medicine and completed his residency at Walter Reed Army Hospital. He served in the Regular Army Medical Corps from 1943 to 1954 and was awarded the Bronze Star of the United States in the Korean Theatre of Operations.

Doctor Edelblute was a radiologist at Bellin Memorial Hospital, Green Bay until his retirement in 1986. He founded the Bellin School of Radiologic Technology in 1957, and he served as president of the Brown County Medical Society and was a member of the 1995 SMS 50 Year Club.

Doctor Edelblute is survived by his wife, Judith; his children, Elisabeth (Christopher) Roll, of Grafton, Amy (Rev Patrick) Cunningham, of Globe, AZ, Stephen (Janet) of Henderson, NV, John (Louise), of Derry, NH, Anthony of Boulder, CO; his stepchildren, Todd (Dawn) Wiese, of Algoma, Amy (Mark) Herro, of Grandville, MI, eight grandchildren; seven step-grandchildren and one great-grandchild. He was preceded in death by his wife, Beverly.

Kuhn, Raymond V., MD, 94, of Oshkosh, passed away September 27, 2000. He earned his medical degree from the University of Wisconsin and completed his internship and residency at Akron City Hospital, Akron, OH. He served as Captain in the Army during World War II and held memberships with the American Medical Association, the American Society of Abdominal Surgeons, and Winnebago County Medical Society.

Doctor Kuhn was medical director of Bethel Home. He had served on the Board of Directors of the Winnebagoland Council of Camp Fire Girls, was a Red Cross volunteer and member of the 1986 SMS 50 Year Club.

Doctor Kuhn is survived by his children, Richard (Joan) Kuhn, of Willmar, MN, Rebecca (David) Cleveland, of Neenah; his brother Roland (Eleanor) Kuhn of Elkhart Lake; nine grandchildren, Tim, Dave, Mike, John, Ben, Courtney, Matt, Joshua, Erin; and a daughter-in-law, Jane Kuhn, of Oshkosh. Doctor Kuhn was preceded in death by his wife, Treva, and a son, Philip Kuhn.

Meighan, Pearse P., MD, 79, of Waupaca, passed away October 13, 2000. He earned his medical degree from Marquette University Medical School and served his internship at St. Raphel Hospital in New Haven, CT.

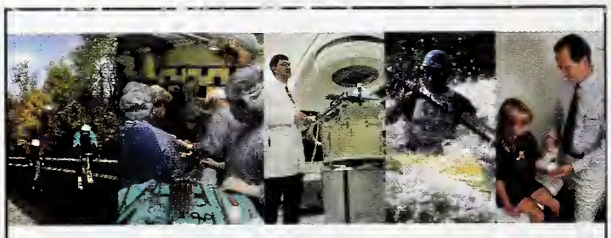
Doctor Meighan practiced medicine in Whitewater from 1948 until 1953. He served a residency in pathology at Wood VA in Milwaukee until 1954 and at Armed Forces Institute of Pathology, Washington, DC until 1958. He went on to practice pathology at Appleton Memorial Hospital from 1958 until 1986.

Doctor Meighan is survived by his wife, Jane; his children, Pat (Mimi), of Waupaca, Mike, of Asheville, NC, Kevin, of Waupaca, Mary (Harry) Dahlstrom, of Appleton; 14 grandchildren and one great-grandchild. He was preceded in death by two children, Sheila and Sean.

Miller, Owen E., MD, 78, of Waukesha, passed away October 29, 2000. He earned his medical degree from Loyola University, Chicago, IL, completed his internship at the US Naval Hospital in Memphis, TN, and his residency at the Medical College of Wisconsin.

Doctor Miller served in the US Navy during World War II in the South Pacific aboard the USS Oberon. He was a doctor of orthopedic medicine with Kriter, Desch and Miller for over 20 years at Waukesha Memorial Hospital and served 30 years on the board and executive committee of Wisconsin Physicians Service Insurance Company.

Doctor Miller is survived by his daughter, Catherine T. Miller, of Milwaukee. He was preceded in death by his wife, Mary, and a son, John.



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Guest Editorial

Strong SMS/DPH Partnership Needed

John Chapin, Administrator, Division of Public Health

A central organizational objective of the Division of Public Health is to build a strong working relationship with the State Medical Society. I am working with SMS President Ayaz Samadani, MD, on Organ Registry issues. So that public health officials get to know the SMS president, I sent a copy of his delightful inaugural address to every local public health director. William Scheckler, MD, the SMS representative to the Public Health Advisory Committee, has been instrumental in the transformation of this group to true advisor status to DPH and DHFS. He is now vice-chair of that committee. Dr. Sharon Fleischfresser from DPH was instrumental in working out a compromise between DPH and SMS physicians on newborn data issues. That compromise is now law.

The DHFS/EMS Trauma Committee is well underway and chaired by SMS member Stephen Hargarten, MD. Joint efforts on diabetes, antibiotics and injury are ongoing and very productive with physician leadership. One of our newest committees, a statewide Immunization Advisory Group, is also well represented by the SMS. These are just a few examples of the scores of situations where SMS physicians are playing key decision making and advisory roles with our organization.

One of the best examples on the SMS side is the creation of the Health of the Public Council. I have asked them to work with DPH on a joint legislative agenda for the next biennium. This is a big step towards being supportive of each other in the legislature, rather than as opponents or rivals for the same scarce dollars. We do not have to agree on everything; but on that which we do-should we not be allies?

I am also, as a DHFS division administrator, sponsoring SMS membership for all our chief medical officers because of its vital importance to our mission. This agenda of collaboration with SMS is being done for very practical purposes. The public relations event earlier this year surrounding the Blue Cross/Blue Shield funding was a classic demonstration of medical schools holding forth on public health in a manner both confusing and alienating to the public health community. Their presentations and written plans indiscriminately interchange words that have completely different meanings as concepts. Public health was presented as medicine, health care and health of the population, population health, basic genetics research and building virtual classrooms for academic programs. These things, which are good things but which are not public health, were presented as public health. In the January 2000 issue of *WMJ* and a letter of support from the SMS to the Office of the Commissioner of Insurance, these proposed activities were accepted as a public health benefit.

That is why the articles about public health in these last issues of *WMJ* were so important. DPH and the public health community want Wisconsin physicians educated about what public health is actually about in Wisconsin. We need allies in that political struggle who understand what public health is. Without strong proponents within the physician community that understand the role of public health, the political struggle for public health dollars and legislation is weakened. Without more clarity, resources go to health care, medical research, facilities or academic educational programs and a victory is declared for "public health," while state funding for front line public health stays flat at the price of a couple of packs of cigarettes per citizen per year.

Guest Editorial

I was saved by a seat belt . . .

Would my 5 year old have been so lucky?

by Deirdre Burns, MD

As a general pediatrician who regularly counsels her patients to use seat belts, I would never have guessed how relevant the topic of automobile safety would become to my own life.

One recent bright summer morning, I had finished rounds, stopped to do a few errands, and was happily on my way home feeling nearly as immortal as any teenager might. I crossed a familiar intersection after the light had turned green and glanced out of the front passenger window to see another car approaching mine at high speed through a red light. In the milliseconds before I was hit, I turned my car so that the rear passenger door was struck. I felt the impact as my body was thrown against the side of the car. Thereafter, my car bounced and rolled. I felt as though I was floating inside the car. Witnesses told me later that my car had actually rolled end over end. When it landed, I was dangling upside down from my seat belt with a mouthful of broken glass, a bruised and lacerated elbow, but amazingly intact. No head injury. No neck injury. Wearing a seat belt had saved me!

As I waited in the wreckage for EMS to arrive, one of several passersby who had stopped to offer assistance spotted my young daughter's booster seat in the back of the car. In a panicked voice, she asked me if I was the only person in the car. I remember feeling enormously grateful that my daughter had not been with me that morning. Since the crash, I've often wondered if she would have fared as well as I did. I'm not at all certain that wearing a seat belt would have saved her.

Eliza is 5 years old and weighs 45 pounds. According to Wisconsin's child passenger safety law, children in her age group (age 4 to under 8 years) must be restrained in a child safety seat ***or*** by a safety belt. This implies that a child safety seat and a seat belt offer equivalent protection. I must admit, against my better instincts and, in part, lulled into a false sense of security by my knowledge of this law, I had allowed Eliza to ride occasionally secured only by a seat belt. As I can now state through personal experience, seat belts work well for adults; however, *for young children, seat belts are not enough!*

Seat belts do not properly fit most children through age 8. A properly fitting lap belt should fit low and snug on the hips. This requires mature anterior iliac spines to anchor the belt and a femur length that allows the child to sit against the back of the seat. In addition, the shoulder portion of the seat belt should cross the shoulder and the sternum, *not* the child's neck. When a child is improperly restrained by a seat belt so that the lap belt rides high on the abdomen and the shoulder portion crosses the neck, the child may "submarine" or slide out of the seat belt during a crash. Many parents allow children to ride with the shoulder portion of the seat belt behind their back or under their arm to avoid the discomfort of riding with that portion of the belt across their neck. This practice places the child at risk for "seat belt syndrome," which is the name given to the intra-abdominal and spinal cord injuries caused by rapid bending about an improperly positioned lap belt. In addition, young children restrained solely by seat belts are at greater risk of head injury due to increased head excursion and contact with the child's knees or interior of the car. Proper seat belt fit in children 4 to 8 years of age requires the use of a belt-positioning booster seat. Booster seats should not be used to restrain children under age 4.[1]

In a recently-published study of seat belt use among children age 2 to 5 years derived from State Farm Insurance Companies' claims data, those children who were restrained using only seat belts had a relative risk of

Doctor Burns is a Pediatrician with UW Health, Physicians Plus, Madison, WI.

significant head injury of 4.2 when compared with those who were restrained using child restraint systems. That same study found that although 95% of the children in their study population were restrained, seat belt use began at age 2 years, was the most common form of restraint by age 4 years, and less than 1% of children over age 5 years were restrained in booster seats.[2]

Since my car crash, I have discussed child car safety issues in much more detail with families in my practice. Proper restraint of young children and infants is a complex issue and sometimes can seem overwhelming to the busy practitioner. Premature use of seat belts is one issue; improper installation of child car seats is another; appropriate restraint of the premature infant or child with special needs yet another. Fortunately, two very helpful web sites are available to patients or office staff to help answer questions and promote child car occupant safety. The American Academy of Pediatrics' "2000 Family Shopping Guide to Car Seats" is very comprehensive and can be downloaded from their web site at http://www.aap.org. The National Highway Traffic Safety Administration's web site at http://www.nhtsa.dot.gov is another good resource. The NHTSA also offers a 4-day Standardized Child Passenger Safety Training Program. Many Wisconsin physicians and hospitals are sending a staff member for training. (For further information, contact Wisconsin SAFE KIDS Coalition 715.344.7101.)

Motor vehicle-related injuries are the leading cause of death of children older than 1 year in this country. Premature graduation of young children to seat belt use contributes to this statistic. Unfortunately, the law in our state governing seat belt use in children ages 4 to 8 may contribute to premature use of seat belts in this age group. As child safety advocates, pediatricians and family practitioners should inform families that, although use of a seat belt alone is not illegal, children in this age group would be safest if they used a belt-positioning booster seat.

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1. Winston FK, Durbin DR. Buckle Up! Is not enough. *JAMA*, 1999;281:2070-2072
2. Winston FK, Durbin DR. Kallan MJ, Moll,EK. The danger of premature graduation to seat belts for young children. *Pediatrics* 2000;105:1179-1183

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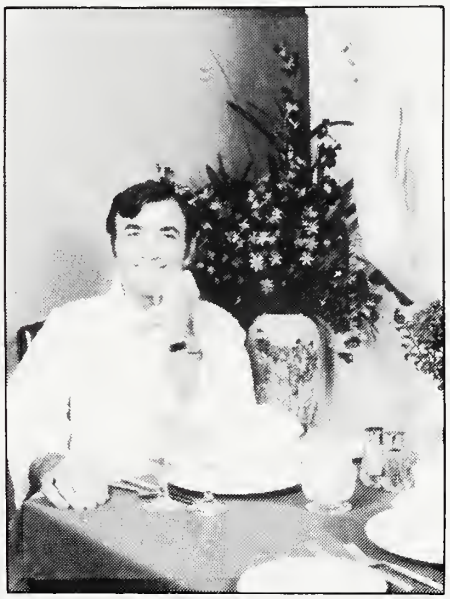

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A Current Evaluation of Injury Programs in Wisconsin

Linda J. Hale, RN, BSN

"If some infectious disease came along that affected children in the same proportion that injuries do, there would be a huge public outcry, we would be told to spare no expense to find a cure, and to be quick about it."

Statement by Surgeon General C. Everett Koop before the subcommittee on Children, Family, Drugs, and Alcoholism, US Senate, February 9, 1989

Background

Injury is among the most under-recognized major public health problems facing Wisconsin and the nation today, despite the fact that the data clearly demonstrate an epidemic. Approximately 150,000 people die each year from injury in the United States.[1] In Wisconsin in 1998, more than 2700 or 6% of deaths resulted from injuries.[2] The numbers are displayed in Table 1. Injuries are the third leading cause of death in the United States and they are the fourth highest category of death by underlying cause in Wisconsin, following cancer and diseases of the circulatory and respiratory systems.[1,2] The data also show that injuries are a disease of the young; for people of Wisconsin and the nation ages 1-44, injuries are the leading cause of death.

The estimated cost of injury to the nation is approximately $224 billion annually, and consists of costs of direct medical care, rehabilitation, lost wages, and productivity losses.[1] The $224 billion represents a 42% increase over the last decade.[1] Public sources (federal, state, and local) pay about 28% of the cost of injuries.[3] Private sources (e.g. insurance) pay about 72% of the costs.[3] The federal government pays about $12.6 billion annually in medical costs and $18.4 billion in disability and death benefits.[3]

Injury prevention and control advocates encounter a culture of fatalism. While Americans recognize that injuries occur and are relatively common, most believe that injuries and resulting deaths are inevitable and unpreventable tragedies.[4] The primary challenge is to change the public perception of injury to that of a deadly, but preventable "disease" which can and should be eradicated.

Nationally for every injury death, an average of approximately 18 hospitalizations, 233 emergency department visits and 450 physician visits are logged.[1] Every year in the United States, approximately 40 million emergency visits result from nonfatal injuries, and more than 72,000 people are disabled as a result of their injuries.[1] In 1998 in Wisconsin, more than 60,000 persons were injured in motor vehicle crashes alone.[5]

Ms. Hale is Injury Prevention Section Chief, Bureau of Emergency Medical Services & Injury Prevention, Division of Public Health, Department of Health & Family Services.

Public Health Agenda for the Year 2010

Wisconsin's Turning Point will transform our state's public health system to address current and emerging 21st century health problems and issues. The goals are to improve the health of all, reduce health disparities, and build a contemporary public health system utilizing the essential services of the public health system. Turning Point is grounded in nontraditional partnerships and involvement of citizens and interested organizations throughout the state.

Turning Point has identified 11 public health priorities, injury—both unintentional and intentional–being one of them. These priorities included in the state health improvement plan will drive our injury prevention work into the new millennium and beyond. Much of the health conditions and risk factors priority work is paralleling the Federal Healthy People 2010 initiative.

The Changing Focus of Injury Prevention

While disease death rates have decreased over the past decade and we have seen remarkable advances in health care delivery and environmental safeguards, injury death rates have remained steady or in some cases have actually increased. Therefore, injury prevention remains a national priority into the next millennium, as evidenced by the new National Healthy People 2010 public health plan.[6] Of the

Plan's 485 objectives, 66 address injury; 39 of them are found in the section on "Injury and Violence Prevention," and the remaining 27 are integrated in other subject areas.

Examples of Injury Prevention Efforts in Wisconsin

The Federal Maternal and Child Health (MCH) Block Grant funded 24 injury prevention projects in 18 Wisconsin counties from October 1994 through the end of December 1999.

These projects focused on intentional and unintentional injury prevention. Examples include home assessments; installation of safety devices; and safety education to schools, childcare centers, Head Start projects and WIC Clinics. Some, such as Iron County, focused specifically on bike helmet safety and safe riding skills. Others, such as La Crosse County, were more encompassing. They educated families about home safety, gave training sessions for home visitors, and participated in media awareness campaigns to increase the public's knowledge of injuries and their awareness of the linkage between health and safety.

These Injury Prevention MCH Projects developed culturally specific and age specific programs. For example, the Black Health Coalition, through its Family Resiliency Project, aimed to prevent youth violence by tapping into strengths and resiliency among African American families. After completing a research project to identify resiliency factors among African American families in central Milwaukee, they translated their findings into a violence prevention curriculum for Milwaukee Public Schools.

Several projects established new community coalitions and partnerships to assure their continuation when the MCH Block Grant cycle ended in December 1999. These projects developed community awareness regarding their efforts and resulted in decisions to dedicate local resources to safety promotion.

Table 1. Comparison of national data to Wisconsin data for 1998

	Nationally each year[1]	1998 in WI[2]
Motor Vehicle	41,000	708
Fires, Drownings, Falls, Poisonings	28,000	Fires: 65 Drownings: 67 Falls: 520 Poisonings: 142 (unintentional) Total 794
Suicide	35,000	593
Homicide	25,500	188

In addition to the specific MCH funded injury prevention efforts, home visitation programs throughout Wisconsin have incorporated injury prevention as a central component of their services. Examples include the Child Care Coordination Program occurring in the Milwaukee Family Project, the state-funded child abuse and neglect prevention grants (POCAN), which include a home visitation program, and the Prenatal Care Coordination (PNCC) Medicaid Benefit.

Barriers

Nevertheless, practitioners and advocates encounter numerous barriers to implementation of these strategies. While these barriers include the fatalistic cultural attitude about injury, they also include lack of adequate data to assess effectiveness of the interventions, training and funding. The national lack of public interest and outcry may relate in part to limited availability of data and quality analyses and also to inadequate dissemination of information about successful programs. Nationally, other barriers include the limited availability of trained prevention and control practitioners to perform these functions, as well as inadequate funding to support the development, implementation and ongoing evaluation of injury prevention and control programs.

During the last decade, recognition of the importance of injury resulted in the creation of state and national injury administrative units. In 1992, CDC established the National Center for Injury Prevention and Control (NCIPC) as the lead federal agency for injury prevention. The NCIPC works to reduce morbidity, disability, mortality and costs associated with injuries.

Similarly, in its 1998 reorganization, the Wisconsin Department of Health and Family Services created a Bureau of Emergency Medical Services and Injury Prevention within the Division of Public Health (DPH). The duties of the Department, noted in Wisconsin Statute, Section 255.20, Subchapter III (1998), require that the Department:

1) Maintain an injury prevention program that includes data collection, surveillance, education and the promotion of intervention.
2) Assist local health departments and community agencies by serving as a focal point for injury prevention expertise and guidance and by providing the leadership for effective local program development and evaluation.
3) Enter into memoranda of understanding with other state agencies to reduce intentional and unintentional injuries.

Injury 101

In the public health model of disease, an injury is defined as any unintentional or intentional harm

Table 2. Injury prevention strategies and examples of each

STRATEGIES	EXAMPLES
Engineering/Environmental changes	smoke detectors, improved street lighting, road design
Education	providing information and training to support behavior change- e.g., mass media campaigns, social marketing, parenting classes, reminders for consistent use of personal safety equipment
Enactment	ordinances, statutes and policies, e.g., primary seatbelt laws, use of bike helmets, handgun safety measures, fire safe cigarettes
Enforcement	seat belt laws, speeding, drinking and driving
Emergency Response	interventions that decrease the severity of the injury outcome, e.g., trained and appropriately deployed first responders and a statewide Trauma System
Economic Incentives	direct or indirect benefits for positive behaviors, e.g., social marketing techniques, awards, insurance benefits
Evaluation	availability and use of data and information, e.g., data-driven policy and program decisions
Empowerment	encouragement of positive mores and focus of action at the community level, e.g., Safe Communities programs.

done to the human body and organ systems from an acute exposure to thermal, mechanical, electrical or chemical energy or from the absence of such essentials as heat or oxygen.[4] Injuries are divided into two categories:

a) unintentional injuries, such as falls, burns, motor vehicle related events (child occupant, pedestrian and bicyclist), poisonings and drowning, and
b) intentional (violent) injuries, such as suicide and homicide, and assaults such as sexual assault, intimate partner violence, peer violence, and child and elder abuse.

However, the classification of injury according to intent may be difficult to determine, indicating the importance of carefully examining the wide range of factors contributing to the event. Risk factors for injury include income, neighborhood, alcohol and other substance abuse, absence of resilient factors, personal history of abuse of a parent or caregiver, isolation and age. At the same time however, injury crosses all socioeconomic boundaries and may affect all children and families.

Like diseases, injuries follow distinct patterns and most are predictable and preventable. Injury prevention requires an understanding of how the multiple characteristics of injury-related events interact. Injury prevention needs to be integrated into all efforts that strive to ensure the health and safety of children and families.

William Haddon, Jr., of the New York State Health Department and a nationally-recognized injury prevention expert, extended the public health epidemiological model, noting that the injury host, agent and environment can be conceptualized as occurring in three phases: pre-event, event and post event phases. (His model is known nationally as the Haddon Matrix.)

Pre-event factors are those factors that create potential for injury and where primary prevention can be implemented, such as conflict resolution and parenting programs, divided highways or enforcement of speed limits.

Event factors affect the severity of injury and are where secondary prevention measures such as airbag deployment or installation of breakaway signposts come into play.

Post event factors influence the outcome of the injuries with the focus on effectiveness of emergency medical services, minimal trauma response times, or rehabilitation programs, etc.

The phase-factor model of causation can be used to direct choice of strategies for injury prevention and control. Behavioral change is most effective when multiple and simultaneous strategies are deployed. These strategies may include both active and passive countermeasures. Passive (or automatic) countermeasures require little or no action on the part of the individual being protected. Airbags, child resistant medicine bottles and nonflammable sleepwear are examples. Passive measures are more likely to be effective because they are less likely to conflict with values and less likely to fail due to human error or forgetfulness. Active countermeasures, on the other hand, require individual action each time protection is required, i.e. seat belts, correct use of child passenger safety seats, use of bicycle helmets, avoidance of drinking and driving, or moving poisons and medications out of the reach of toddlers.[7]

Injury prevention strategies and examples of those strategies are described in Table 2.

Injury Prevention in Wisconsin

In the 1980s, one of the first significant state injury prevention efforts involved obtaining and imple-

menting a three-year federal Maternal and Child Health Improvement Program (MCHIP) Grant. The Wisconsin Comprehensive Child Injury Prevention Program (WCCIPP), as it was called, was located in the (then) Bureau of Community Health and Prevention, Division of Health. This organizational placement was significant because it brought to the forefront the fact that too many children die or are severely hurt as a result of injuries that could and should be prevented.

Meanwhile, national activity concurred with Wisconsin's interest and efforts. In the late 1980s, Dr. C. Everett Koop, then US Surgeon General, urged all governors to take a "hard look" at their administration's injury prevention programs. Governor Tommy Thompson proclaimed June 1, 1989 through June 1, 1990, the "Year of Child Trauma and Injury Prevention" and, supported by National Highway Traffic Safety Administration (NHTSA) funding, a 16-member multidisciplinary member task force chaired by Lt. Governor Scott McCallum was formed.

The mission of the Lieutenant Governor's Trauma and Injury Prevention (TIP) Task Force was to 1) establish collaborative relationships among state agencies regarding injury prevention and control; 2) create injury prevention awareness by disseminating knowledge to the public that injury is a major public health problem; 3) provide current information on injury prevention and control programming for state and local health planning priorities; 4) help shape public policy as it relates to injury prevention and control activities; and 5) identify opportunities for future progress. It was a remarkably successful effort on many fronts.

One of the most important accomplishments was the development of legislation to fund a state injury prevention program in the Division of Health. Wisconsin was the first state in the nation to have a state-funded injury prevention program. Approximately $300,000 of state general purpose revenue was earmarked for state infrastructure development (which included funding 3.0 full time positions) as well as providing mini-grants to local public health departments and non-profit organizations for local injury prevention activities. In subsequent years, local public health departments used some of their Title V MCH Block Grant allocations to provide injury prevention activities that addressed home safety, day care safety, fire safety, motor vehicle safety, and child abuse and neglect prevention.

To elevate injury prevention within the Department, the Title V MCH Block Grant funded position was transferred to a newly established Injury Prevention Section within the Bureau of Emergency Medical Services and Injury Prevention Section during the 1998 reorganization of DPH. This move was significant because it expanded injury prevention concerns to the adult population as well. The overall goals identified by the Injury Section include:

- Reduce unintentional and intentional injuries and deaths across the age span in the state of Wisconsin;
- Coordinate and assist in the strategic planning of injury prevention activities in the state;
- Coordinate statewide emergency response for public health outbreaks and incidents;
- Provide technical assistance, resources, prevention program expertise, injury data surveillance and dissemination;
- Evaluate program achievements and outcomes.

Progress

Some public health efforts to prevent injuries have been highly successful. For example, nationally an estimated 240,000 lives were saved between 1966 and 1990 because of improved motor vehicle and highway design, increased use of safety belts and motorcycle helmets, and enforcement of laws regarding drinking and driving and speeding. Similar results are possible with other types of injuries.[3] Multiple strategic approaches, e.g. education, environmental changes, enactment and enforcement were implemented to address the very complex issues surrounding injury identified above, overall making an impact of thousands of lives being saved.

Transportation – The 1999 Mileage Death Rate was 1.31 and the Population Traffic Death Rate was 14.17/100,000.

Transportation-related data are among the most complete injury data available. The Wisconsin Department of Transportation (WisDOT) provides annual crash data for all jurisdictions within 4 months of the end of the calendar year, and reports these data in annual Traffic Crash Facts, Alcohol Crash Facts and other publications. Motor vehicle crashes and fatalities continue to occur most frequently in our young adolescent/young adult male population and in the aging population greater than 65. Detailed risk factor analyses can be found in WisDOT's annual Highway Safety Performance Plan.

According to the 1998 Wisconsin Alcohol Traffic Facts Book provided by the WisDOT, Bureau of Transportation Safety, since 1988, alcohol-related motor vehicle crashes have declined 39% (from 13,847 to 8475).

There were changes in the law that might be linked to the partial reduction in these types of crashes. In 1987 Chapter 3, Laws of 1987, created immediate (30 days after the violation) license suspension for 6 months for a blood alcohol concentration of 0.1 or greater; Chapter 105, Laws of 1989, created new Operating While Intoxicated (OWI) statutory provisions

for commercial vehicle operators reducing the blood alcohol concentration level to .04; Chapter 277, Laws of 1991, created new penalties and treatment opportunities for OWI repeat offenders. This law included possible seizure of vehicles, increased penalty for Homicide by Intoxicated Use, a blood alcohol concentration of .08 for persons with two or more offenses, and easier access to treatment; Act 127 amended and expanded the OWI laws to include offenses taking place on rental property and in employee parking lots.

Motorcycle Safety – In 1977 the Wisconsin state law was changed from requiring universal helmet use to only those cyclists who are less than 18 years of age or have a cycle instruction permit. Currently 20 states have universal mandatory helmet laws, while 30 do not. The most recent helmet observational study in the state of Wisconsin (1993) revealed 44% statewide average motorcycle helmet usage.

We have opportunities for further success with this objective through the implementation of multiple strategies such as education, promotion of protective gear and enhanced enforcement.

Bicycle and Pedestrian Safety – For more than 25 years, WisDOT has been promoting bicycle and pedestrian safety. But within the past 10 years, the Bureau of Transportation Safety established a permanent program with full time staff responsible to improve bicycle/pedestrian safety, implementing public education and information programs to decrease mortality and morbidity from pedestrian/bicyclist injuries. Data are compiled and analyzed to evaluate the effectiveness of their efforts. The presently available data have the limitation that it is only collected if a motor vehicle is involved with the crash.

E-coding of Injury Related Data – With the enactment of 1993 Wisconsin Act 185, E-coding for all injury hospital discharges became a state requirement in 1994, making Wisconsin the 15th state to require collection of this information. The Office of Health Care Information receives these data as part of the State's Hospital Inpatient Discharge Data set. E-coded hospital discharge data have been collected since April 1, 1994. Review of the files for two calendar quarters (4/1/94-9/30/94) showed that about 98% of the injury discharges have an associated E-code, up from 30% prior to enactment of the law.[8]

Drowning and Aquatic Injuries – According to the Department of Natural Resources, Boating Law Administrator in the Bureau of Law Enforcement, Wisconsin law requires people on personal watercrafts to wear personal flotation devices. That law went into effect in 1993. The law, Wisconsin Statute 30.62(3)(b), states: "(b) No person may operate a personal watercraft unless each person riding on the personal watercraft is wearing a personal flotation device that is a type I, type II, type III or type V personal flotation device as specified under Federal regulation 33 CFR part 175, subpart B."

Suicide – In 1989, the Wisconsin suicide mortality rate overall was 12.22 per 100,000. In 1998 in Wisconsin, the suicide mortality rate overall was 11.02 per 100,000 compared to the United States rate of 11.31 per 100, 000. In Wisconsin, suicide is the eighth leading cause of death for all ages, but is the second leading cause of death in 15–34 year olds as identified by National Center for Injury Control and Prevention data on suicide mortality. Young adults (15-34 years) and elderly (>65 years) are among the high-risk groups.

In 1988 a state youth suicide prevention plan was written to address youth suicides and attempted suicides. It was designed to provide youth and adults with an awareness of the problem and an understanding of how to cope with the stresses which may lead to suicide. The generic plan was community- based, school-focused, proactive, represented a collaborative approach. It was created to encourage the development of materials and resources that would be available to public and private schools for use in developing youth suicide prevention programs. That plan is now being reviewed with the intent to update and expand it to the greater population of Wisconsin.

Work to be Done

As demonstrated in the previous examples, progress has been made over the past 10 years, but there is still much work to be done in those categories of injury as well as the following areas.

Training of clinical health professionals – In 1995 it was noted that there was no data currently being collected or mechanisms in place to tell us about the training of our physicians and other health-related professionals (social workers, nurses, nursing assistants, physical therapists, etc.) as it relates to injury in general, let alone specific kinds of injuries. For example, intentional injuries where the health care provider can identify, treat appropriately and refer victims, perpetrators and persons at high risk; or in the unintentional injury area of falls, risk factor identification among the elderly and offering falls prevention counseling and monitoring. The same is true today. We have a better understanding of how important education of our clinical health professionals is in relation to this area but we don't have a mechanism in place to tell us how many medical schools and schools of nursing are including training on violence or falls as examples in their curricula; if primary health care providers routinely identify signs and symptoms of intentional injuries and suicidal ideation with

their patients, or if all Wisconsin hospitals have protocols for responding to assault victims, including battered spouses and sexual assault victims, and emergency department personnel trained in their use.

Falls – In 1989 in Wisconsin, the falls death rate was 5.10 per 100,000 population. In 1997 Wisconsin fall death rates were 8.03 per 100,000 population as compared to 4.24 per 100,000 population in the United States. Wisconsin ranks in the top third of all the states for falls deaths.

Opportunities – For many injuries, especially those associated with products like motor vehicles and guns, those who are in a position to create safer products may not have economic incentives to do so. The costs of injuries are borne by those who are injured, their families, taxpayers who support the health-care system and the businesses who pay for health insurance rather than the manufacturers of the products.

Data remains an issue–issues of collection, access and capacity to analyze, report and disseminate it in a format that can be used to drive injury prevention program development and positive outcomes. There are opportunities for Wisconsin in this arena. Wisconsin has access to the 11 data sets recommended for an injury surveillance system in a state health department as noted in the "Consensus Recommendations for Injury Surveillance in State Health Departments." This document was produced by the State and Territorial Injury Prevention Directors' Association in September of 1999 and funded by a cooperative agreement from the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC). These 11 data sets include vital records, hospital discharge data, the Fatality Analysis Reporting System (FARS), the Behavioral Risk Factor Surveillance System (BRFSS), the Youth Risk Behavior Surveillance System (YRBSS), emergency department data, medical examiner or coroner data, child death review data, the National Occupant Protection Use Survey (NOPUS), the Uniform Crime Reporting (UCR) system, and emergency medical services data. The development of an injury surveillance system – for both intentional and unintentional injuries will be one of the priorities for the Injury Prevention Section within the Bureau of Emergency Medical Services and Injury Prevention, Division of Public Health with funding just received from the CDC. The funding is for state injury capacity building which includes both surveillance and program development.

Another opportunity for data improvement exists with the development of an injury registry in our statewide trauma system. Such a registry should provide injury professionals and advocates data on the majority of injuries occurring in Wisconsin. The State Trauma Advisory Council's proposed state injury registry recommends there be regional collection systems in place, which will permit a focus on the injuries most common to their locale and permit local development, coordination, implementation and evaluation of local injury prevention programming and training.

It is difficult to determine the causes for injury trends. For example, some motor vehicle injury trends are alarming and no single factor can explain them. After so many years of countermeasures, why were there 62,296 motor vehicle crash injuries and 709 deaths in Wisconsin in 1998? In 2000, if fatal motor vehicle crashes continue to occur at this rate, by the end of the year more than 900 people will have died on Wisconsin roadways – a "disaster" not seen for more than two decades. We can theorize that this increase is due to increased speeds from a mild winter. Maybe most of the environmental improvements in the automobiles and roadways have been in place and their protection no longer counteracts our increased travel. Or maybe it's because of a change in enforcement practices or a change in our educational outreach. Or maybe there is no single reason.

But possibly the upward trend in motor vehicle crash deaths reflects the fatalism discussed previously; the attitude "it won't" or "can't happen to me," as well as the lack of interest in making changes in one's own behavior. Public outcry against the number of lives lost hasn't been loud enough yet to make a change in Wisconsin's secondary enforcement seatbelt law. In Wisconsin, law enforcement cannot stop a vehicle if an adult is not wearing a seatbelt, but we can be ticketed for not wearing a seat belt if we are stopped for another violation. NHTSA predicts that a primary seat belt law, combined with enforcement and education, will result in an immediate 10%-15% increase in seat belt usage. (Presently in Wisconsin our observed statewide average seat belt use is 65%.)

Injury is a major public health problem with a big price tag. Most believe injuries and resulting deaths just happen and are unpreventable. But with the applications of multifaceted injury prevention strategies, i.e. education, empowerment, engineering, emergency response, enactment, enforcement, evaluation and economic incentives, we can reduce the morbidity and mortality of Wisconsin's residents from injuries. We have the technology...do we have the support of policy and decision makers and will injury prevention be viewed as an important and needed component of our daily lives?

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The Injury Epidemic: Where do we stand?

William H. Perloff, MD, PhD

Unintentional and inflicted injury continue to exact a horrific toll of death and disability, largely among young people. Data from the article by Hale in this journal[1] (p. 12) suggest that we have made little, if any progress in changing injury outcomes since the Wisconsin public health plan for 2000 was published in 1990.[2] Deaths from injury actually increased between 1986 and 1998, the last year for which complete data are available.[3] Mortality from major causes, motor vehicle crashes and inflicted violence (homicide and suicide), were substantially unchanged over this period.[3] In addition to the human cost, the economic consequences of injury nationally, and at the state level are profound.[1]

We consider that we live in an advanced, "post-industrial" society, yet we fail to employ proven effective prevention and control measures for many of the major causes of death and disability. Examples of medically straightforward, but politically sensitive issues include:

Seat restraints – Three point automobile seat belt use reduces the risk of death or serious injury in a major crash by about 45%,[4,5] and car safety seats reduce these risks by 70%.[6] Current seat belt use in Wisconsin is 65%,[7] compared to the national average of 70%.[8] The law requiring seat restraint use is Wisconsin's only traffic law that cannot be enforced unless another violation has occurred (secondary enforcement). Evidence from other states has shown that seat belt use increases by 10%–15% when enforcement changes from secondary to primary (standard).[9] In Wisconsin, such a change would prevent approximately 50 deaths each year, and many more disabling injuries. And yet our legislature has not seen fit to allow standard enforcement of the existing law.

Motorcycle and bicycle helmets – Motorcycle helmet use reduces the incidence of severe head injury and head injury mortality by 65%–75%.[10,11] Initial and long-term care costs are about three times as high for hospitalized unhelmeted motorcyclists as for helmeted crash victims.[11,12] Motorcycle helmet use in Wisconsin is only 42% following repeal of a mandatory helmet law in 1977.[13] In other states, reinstating a universal helmet requirement for motorcyclists reduced mortality and serious head injury by approximately 40%-60%,[12,14,15] and would be expected to have a similar effect in Wisconsin. Attempts to reinstate a universal helmet requirement in Wisconsin have failed. The rationale that helmet use is a personal choice ignores the fact that public funds underwrite approximately 25%-50% of medical and related expenses of head-injured motorcyclists.[16]

Bicycle helmets are *twice* as effective as motorcycle helmets,[17] yet are used, all or most of the time, by less than 20% of riders.[18] Only 6% of Wisconsin high school students routinely wear them.[19] A bill requiring bicycle helmet use for those under 18 years of age was voted on by the Wisconsin State Senate in the last legislative session, but was not brought to a vote in the Assembly.

Handgun involvement in interpersonal violence and suicide – Poliomyelitis epidemics created a great public outcry, answered by development of the polio vaccines. The more than 30,000 deaths and 20,000 paralyzed victims due to handguns annually in the United States is more than twice the number paralyzed by the polio epidemics of the 1950s,[20] and yet excite small impetus for change, except when some newsworthy event horrifies our sensibilities. In Wisconsin, there are more than 450 firearm-related deaths annually,[3] exceeding that of many industrialized countries. More than two-thirds of these are suicides, in which rifles or shotguns are used more than one-half the time.[21] Handguns are used in homicides more than 80% of the time when the weapon is identified.[21] Gun ownership is a risk factor for firearm death in the home.[22] A gun in the home is 37 times more likely to be used in a suicide and nearly

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five times more likely to be used in a criminal homicide than in self-defense.[22] Suicide is five times,[23] and homicide three times[24] more common in homes with guns than without.

The political furor aroused by discussion of this topic has inhibited consideration and implementation of approaches to this problem which may soon cause more deaths than motor vehicle crashes nationally,[25] and already does so in Milwaukee.[3] Effective injury control measures reduce inappropriate access to handguns. These could include policies requiring trigger locks and "smart" guns that recognize an authorized user.

These examples illustrate only a few of the causes of death and disability which take a terrible toll on individual and societal resources, and which we have the demonstrated capacity to control or prevent. Priorities for change are only meaningful if they are embraced by policy makers and others with the capability to effect change. Hale[1] suggests that injury control may finally have the attention of legislative and administrative leaders. Evidence for this includes the establishment of an Injury Prevention Section within the Division of Public Health, and the legislative mandate to develop a state trauma system (with an injury prevention component). Nonetheless, it is the test of real resource allocation that indicates the priority in the minds of the policy makers. As physicians primarily concerned about the health and well-being of our patients, we need to help set priorities for injury prevention and control, and work at many levels to ensure that they are achieved.

- In the office, we must ask our patients about injury risk-taking activities and violence in the home, and counsel preventive measures. The Injury Prevention Program (TIPP) from the American Academy of Pediatrics[26] is a useful vehicle for office-based injury prevention counseling for infants, children and adolescents.
- Through involvement as school health advisors we must encourage incorporation of injury prevention into school curricula and programs. This can take many forms, from teaching safe behaviors on and off the playground, to conflict resolution techniques, to dealing with abusive situations.
- We must educate local political leaders, policy makers and legislators, about injury as a public health issue and how effective injury control measures can be. The educational process is important in the long term to help key leaders recognize injury as a public health issue, and injury prevention measures as analogs of immunization against infectious disease.
- And we must assume an advocacy role with the state legislature, state administration and, when appropriate, with local policy makers to pass laws and administrative rules which promote specific features of injury control. If an ounce of prevention is worth a pound of cure, then we might start by encouraging our Administration and Legislature to devote 1/16th (6.25%) of the health-related budget to injury prevention. Advocacy for issues of importance to us as healers, *vis à vis* those which can be seen as promoting our self interest, can only enhance receptivity to our views.

It is our responsibility to speak out to control our greatest and most pervasive epidemic. Excellent general references for increasing knowledge of this area include:

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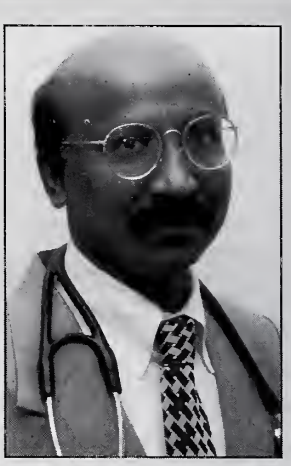

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Community-Based Injury Prevention Programs: Toward a Safer Wisconsin

Nan M. Peterson, RN, MS; Lisa Bullard-Cawthorne, MS, MPH; and Linda J. Hale, RN, BSN

ABSTRACT

Community-based injury prevention programs are an important approach to the reduction of the burden of injury in all age groups. These programs may focus on education and behavioral change, increasing access to safer products, creating a safer environment, and passing and enforcing legislation. This article reviews some of the community-based injury prevention programs in Wisconsin that focus on the prevention of home- and transportation-related injuries. Community participation in the design and implementation of these programs will increase the likelihood of adopting safer behaviors on a community level. We are hopeful that physicians and other health care providers will be actively involved in community-based injury prevention activities in their locale.

INTRODUCTION

In the United States, more than 146,000 people die annually as a result of injuries they received from either unintentional or intentional causes;[1] a fire occurs every minute, someone dies in a motor-vehicle crash every 15 minutes, and more than 3 million children are taken to the emergency room each year for fall-related injuries.[2] The financial costs of injuries are staggering, billions of dollars spent in health care and social support resources, not including the emotional burden resulting from the loss of a child or loved one or the toll of severe disability on the injured person and his/her family.[3] Unintentional injuries are the leading cause of death from ages 1 through 34 years in the United States.[1] In Wisconsin, more than 2600 individuals die from injuries annually, and more than 500 of these are less than age 25 years.[1]

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This paper describes several injury prevention programs initiated in Wisconsin. These programs are multifaceted and involve a variety of collaborators within the community, including physicians and other health professionals.

Three national collaborative models that bring together public and private organizations to reduce injuries in the community include the following:

- *Safe Communities* developed by the National Highway Traffic Safety Administration (NHTSA). This model is defined by an integrated and comprehensive injury control system (prevention, acute care and rehabilitation), expanded partnerships, the use of multiple data sources to define an injury problem and citizen involvement.
- *National SAFE KIDS Campaign*, developed initially by the collaboration of Johnson and Johnson with the National Children's Medical Center. This nonprofit organization has 282 state and local injury prevention coalitions around the country. Wisconsin has 8 such coalitions: Wisconsin State, Chippewa Valley, Fox Valley, Greater Green Bay, Madison Area, Monroe Area, Southeast Wisconsin and Wausau Area. Portage County, La Crosse, Eagle River and Marshfield have local chapters which report directly to the state coalition.
- *SafeUSA*, developed by the National Center for Injury Prevention and Control (NCIPC) at the Centers for Disease Control and Prevention (CDC). The goal of SafeUSA is to help Americans be safe at home, on the move, at school, at work and in the community through an alliance of public and private organizations committed to reducing injuries and increasing the public's sense of personal and community safety. This article explores some examples of Wisconsin-based injury prevention programs designed around the *safe at home* and *safe on the move* components of the SafeUSA program.

SAFE AT HOME

Most of the leading causes of injury-related deaths and hospitalizations—falls, suffocation, poisonings, firearm and fire/burn-related injuries—occur in the home. Injury prevention programs that have targeted a group

of individuals or a geographic community have focused either on individual injuries or on several injury prevention issues that occur in the home. For the most part, Wisconsin community-based programs have been developed to expand an existing program by incorporating home safety issues, to focus on specific high-risk populations, or to expand partnerships and utilize the expertise and help within the community.

General Home Safety

Example 1. Expansion of existing programs

In Marathon County, the Environmental Health Section of the Health Department has expanded its lead toxicity inspections to include other home safety issues such as falls, firearms, fire/burns and suffocation. Safety devices such as smoke detector batteries, cabinet latches, trigger locks and stair gates are given during the visit.

Public health nurses in other health departments across Wisconsin assess home hazards while doing prenatal care coordination visits and either provide safety devices or discounts on safety devices from local merchants, when available.

The Childhood Injury Prevention Program of La Crosse County Health Department developed a training program for home visiting professionals (e.g. public health, Head Start, Healthy Families, Family Resource and social services—both hospital and community). The project includes both injury prevention and environmental health during routine visits. Group presentations and media campaigns have supplemented the home visits to further raise awareness about injuries in the home.

Example 2. Focus on specific high-risk populations.

The Brown County Injury Prevention Program of the Brown County Health Department conducts home safety visits for low-income families with young children. This program has trained professionals who install safety devices during the home visit. Physicians, public health and family service programs make referrals for these visits.

Representatives of the Madison Area SAFE KIDS Coalition, Madison and Dane County Health Departments and the Consumer Protection Product Safety Division have developed educational materials about unsafe nursery products and drawstrings on children's clothing. This information is distributed to day care providers, family service providers, secondhand store owners, those conducting garage sales and nurseries in places of worship to encourage them to destroy or fix these recalled items.

Two locations in Wisconsin, Brown County Health Department and Watertown Public Health Department, have school-based injury prevention programs that target children who are home alone.

A program to assist in the reduction of falls among elderly in Jackson County is a "Seniors to Seniors" program. It is a partnership between high school seniors and healthy older people who are trained as volunteers to monitor the performance and compliance of elders 75+ years of age who are receiving Meals on Wheels, Lifeline, and/or Telecare. These targeted seniors receive home safety evaluations, necessary home modifications, and a basic in-home daily exercise program to increase lower extremity strength and overall stability.

Many of the examples mentioned above target low-income populations, who are often at higher risk for unintentional injuries.[4] Efforts have been made to eliminate economic barriers by providing or subsidizing safety devices, but more work is needed to target non-English speaking populations. Although interpreters have been available with some of these programs, language and cultural differences need to be considered. According to a review of community-based injury prevention programs,[5] the chances of success are greater when approaches are tailored to address unique community characteristics, such as ethnicity or socioeconomic status, and to involve community stakeholders.

Example 3. Expansion of partnerships within the community

The Safe Community Coalition of Madison and Dane County is an example of a community-wide partnership of more than 100 organizations that have joined together in a new injury-prevention partnership. The Neighbor to Neighbor Safe Home Visit Project was initiated by ideas generated from safety and injury prevention listening sessions within the community.[6,7] This pilot project is training neighborhood volunteers to conduct home safety visits for the elderly and families with young children. Monies were secured from a local business to provide home safety devices for volunteers to distribute to participating families.

Specific Home Safety Issues

Example 1. Fires/Burns

Most fire and EMS departments provide fire and burn prevention education in the community. They target both children and older adults who are at higher risk of fire-related injury.[8] Much of the activity targeting children, especially programs within the schools, takes place during fire prevention week (the week including October 9). Topics are aimed at teaching children the importance of smoke alarms, escape plans for fire, calling 911 and "stop, drop and roll" if clothes catch fire. Fire departments such as West Allis have also conducted smoke detector programs, wherein firefighters install smoke detectors or batteries in the homes of older adults.

Example 2. Poisoning

The Wisconsin Poison Control System has poison centers in Madison and Milwaukee. They take calls concerning potential toxic exposures, assess situations,

and recommend appropriate treatment and follow-up care. They are also involved with poisoning prevention activities in the community, especially during poisoning prevention week (the third week in March).

Example 3. Firearm violence

Educating the public about the importance of children not having access to firearms and encouraging the use of trigger locks and other safe storage has been the main focus for firearm prevention programs. Health professionals and law enforcement agencies have taken part in distributing trigger locks in the community. Recently, in conjunction with a national event, a "silent shoe march" (the number of shoes representing those who lost their lives from firearm violence) took place in four locations across Wisconsin, in order to raise awareness and influence legislators about firearm violence.

Physicians can play a vital role in educating the public and influencing legislators about firearm injury and death as a public health issue. Child Safe is a foundation, sponsored by the State Medical Society of Wisconsin, that is dedicated to the prevention of childhood injuries and deaths, particularly due to firearms, through community initiatives and public education. It has produced materials to encourage physicians and other health professionals to include discussion about firearm safety with their patients and in the community. The Wisconsin Anti-Violence Effort Educational Fund is an excellent source of information about professional education and public policy.[9]

SAFE ON THE MOVE

Child Passenger Safety

Motor vehicle crashes are the leading cause of unintentional injury-related deaths among children 14 and under, accounting for 41% of all unintentional injury-related deaths in the United States.[10] Riding unrestrained is the greatest risk factor for death and injury among children as occupants in motor vehicles. It is estimated that, overall, restraints are used for 85% of infants and 60% of toddlers in the United States,[11] although correct restraint use is much lower.[12] The National SAFE KIDS Campaign estimates that 4 out of 5 children who are placed in child safety seats are improperly restrained.[13] In Wisconsin car safety seat check-ups held by local SAFE KIDS Coalitions have observed a misuse rate of 90%–100%. A variety of community partnerships can be forged to improve the proper transportation of children in motor vehicles and reduce child occupant injuries and fatalities. Physicians can play an important role in these collaborative efforts.

Example 1. Community-based child safety seat check-ups

For the past 2 years SAFE KIDS Coalitions across Wisconsin have been providing child safety seat check-up events in local communities. NHTSA-trained child passenger safety technicians, in collaboration with car dealerships, fire/EMS, police and children's specialty stores, have provided an opportunity for families to assess the correct use and installation of their child's safety seat. Using a standardized check sheet, technicians review with families more than 20 points that deal with this complex issue. The events have been extremely well received by the community. Attempts to reach minority and low-income families have been assisted by holding the check-ups (with interpreters) in neighborhood parking lots, fire stations and following an all-Latino Catholic mass.

More recently, Eau Claire and Madison fire departments, in collaboration with SAFE KIDS, have established permanent "fitting stations" for the community. Once a month families can set up an appointment to have their child safety seat checked by technicians from a variety of organizations that come together on that particular day. Using an appointment-only procedure has resulted in less waiting time for families and improved satisfaction for technicians.

Example 2. Partnerships among law enforcement, advocacy, and health care groups

In Madison, the SAFE KIDS Coalition and the newly formed City of Madison Police Department's T.E.S.T. (Traffic Enforcement Safety Team) have formed partnerships to raise awareness about child passenger safety and to promote the correct installation and consistent use of child restraint systems in the community. Project ABC: Always Buckle Children was developed to train T.E.S.T. officers in the basics of child occupant passenger protection and implement a process whereby T.E.S.T. officers would have appropriate child safety seats available in their vehicles for an unrestrained child. Through Child Safe, funding for the purchase of child safety seats was made available for the T.E.S.T. officers. Traffic enforcement officers have a positive role to play in safeguarding children at risk of injury and to provide positive reinforcement to those who protect children properly. As a result of this project, 3 officers have now completed the 4-day NHTSA child passenger safety technician course and regularly participate in check-ups and the fitting station.

Example 3. Partnerships with service clubs to improve the safe transportation of Head Start children

In order to ensure that all Early Head Start children travel in an approved child safety seat, and to reduce the misuse rate of car seats for children ages 4 years and under, a collaboration between the Junior League of Madison, SAFE KIDS and Head Start was established. Head Start staff received training in correct child safety seat use and installation. A Junior League member completed the NHTSA Child Passenger Safety Technician course and is now a resource for the Head Start staff and families. Through the generosity of the Junior

League, child safety seats were made available for each Head Start family that needed one.

Pedestrian Safety

Pedestrian injuries remain the second leading cause of unintentional injury-related death among children ages 5 to 14 years. In 1997, 960 pedestrian deaths of children and adolescents accounted for 17% of all pedestrian deaths in the United States.[14] An estimated 39,000 children and adolescents sustained nonfatal injuries in 1996 as a result of pedestrian crashes.[15] Children ages 5 to 9 years are at the greatest risk from traffic-related pedestrian death and injury. Children are particularly vulnerable to pedestrian death and injury because they are exposed to traffic threats that exceed their cognitive, developmental, behavioral, physical and sensory abilities. This is exacerbated by the fact that parents often overestimate their children's pedestrian skills. Children can be impulsive and have difficulty judging speed, spatial relations and distance. Auditory and visual acuity, depth perception and proper scanning ability develop gradually and do not fully mature until at least age 10.

Example 1. Partnerships among schools, neighborhoods, and safety organization.

To improve child pedestrian safety, create more walkable communities and reduce speeding in school zones, groups in Wisconsin have participated in the annual "Walk our Children to School Week/Walkable Neighborhoods Campaign." A unique feature of the event is that schools, neighborhoods, parents, law enforcement agencies, area businesses and health organizations joined together to make a community safer. In Dane County alone, 20 elementary schools and 22 neighborhoods participated, each developing and implementing a different approach depending on the pedestrian safety issue important for the area. Physical education teachers practiced safe walking behaviors with students, children riding buses organized a "walking school bus," art classes organized poster drawing contests and students carried signs outside school to warn parents of the hazards of unsafe drop-off practices. Neighborhoods also hosted speed boards, held news conferences to explain the rights of pedestrians of all ages in crosswalks and organized distribution of "slow down, watch for kids" yard signs for residents. To learn more about organizing a walk for your community next year, the website www.walktoschool-usa.org is very helpful.

Bicycle Safety

In 1997, 277 children died in bicycle-motor vehicle related crashes in the United States.[14] Head injury is the leading cause of death in bicycle crashes and is the most important determinant of bicycle-related death and permanent disability. Bicycle helmets have been shown to reduce the risk of head injury by as much as 85% and the risk of brain injury by as much as 88%.[16]

A multifaceted approach – Throughout Wisconsin many groups have collaborated to improve helmet use, encourage safe cycling behaviors, and develop environmental improvements such as separating bicycles from motor vehicles. Community groups have formed partnerships with local health care groups and businesses to provide coupons for helmets at reduced cost. Community service and law enforcement groups have collaborated to host bike rodeos to promote safer bicycling skills. Law enforcement and fire/EMS have worked together to reward children with a coupon for an ice cream cone if they are "caught in the act" of wearing their helmets. In Iron County, third grade students participated in a school-based program developed by the public health department that emphasized helmet use and riding skills. In Madison the Traffic Engineering Department Bike/Pedestrian Program hosts bike rodeos with neighborhood groups and after school programs.

Advocacy groups and Wisconsin legislators have joined together to work on legislation requiring the use of bicycle helmets for children, in conjunction with educational campaigns.

ROLE OF PHYSICIANS AND OTHER HEALTH CARE PROVIDERS

In addition to the important role of physicians and other health care providers joining injury prevention coalitions in their communities, they can also promote injury prevention to individual patients and families offices, clinics, emergency departments and hospitals. They can give presentations to parent groups and refer parents to community programs. Examples of efforts being made in physician offices, community health centers and public health clinics include the provision of anticipatory guidance, brochures and fact sheets in the waiting areas, posters and information on the walls, staff trained to provide counseling on proper child safety seat and booster seat use and installation. By having a NHTSA-trained member of their office or hospital staff, physicians can also provide the community with an important resource for families for child safety seat issues. Physicians are also needed to speak out for continued and improved funding of injury prevention activities, as well as to assist with legislative advocacy, especially through the Wisconsin chapters of their professional organizations.

CONCLUSIONS

The activities involved in injury prevention are large and complex, and no one group can solve the injury problem alone. Injury stakeholders including business, local government, public health, healthcare providers,

law enforcement, EMS, fire services, transportation, community and civic groups, schools and the media all have a part to play in reducing mortality and morbidity from injuries. Attacking the injury problem through community partnerships is the key to reducing the ravages of injury in the state. New coalitions and partnerships need to be encouraged and supported. Because of the costs and overall effects injury has on society as a whole, the more widespread and coordinated the efforts, the more likely we will see a reduction in injury. Leadership and coordination are required to bring together diverse groups to focus and work on a comprehensive approach to injury prevention. By working together, injury stakeholders avoid duplication and fragmentation. Their resources can be maximized and communities can create innovative solutions to their specific injury problems.

Key stakeholders must first identify the local injury problem. This can be accomplished by performing a needs assessment, gathering the data as well as the perceptions within the community. Identification of available local resources needs to be part of the data collection. An understanding of the roles each key stakeholder will play in this process of injury prevention and control, as well as how they will work together to reduce injuries, is also critical. New partnerships provide new opportunities and innovative ways to approach problems.

In summary, development of community-based injury coalitions or partnerships offers a number of potential advantages over working individually or independently, including the following:

- Expansion of resources,
- Ability to achieve a more widespread reach within a community than any single organization could accomplish,
- Accomplishment of objectives beyond the scope of a single organization,
- Greater credibility,
- Provide a forum for sharing of information and understanding the broad perspective,
- Foster cooperation between and among a variety of groups.

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Trends in Motor Vehicle Deaths in Wisconsin, 1986-1996: A Decade of Progress?

Julie L. Mitchell, MD; Angela R. Russell, Jessica R. Schumacher

ABSTRACT

Motor vehicle-related injuries are a major cause of death and economic burden in Wisconsin. We examined motor vehicle-related mortality trends in Wisconsin from 1986 to 1996. During this time, overall mortality decreased by 12% and Wisconsin has met its year 2000 goal. However, mortality rates did not improve for women and non-whites. In addition, mortality rates increased in persons over 75 years. There are several explanations that may account for the overall mortality rate decline, but the reasons for the differences between age, racial, and gender groups are unclear.

INTRODUCTION

Motor vehicle-related injuries are a major cause of death. In Wisconsin, 744 persons were killed in 674 motor vehicle traffic crashes in 1999 alone.[1] Motor vehicle-related deaths are also a significant economic burden. In 1999 in Wisconsin, the total cost of motor vehicle crashes was $2.5 billion.[1]

A decade ago, *Healthier People in Wisconsin: A Public Health Agenda for the Year 2000* listed an objective to reduce the motor vehicle mortality rate to 16.0 per 100,000 by the year 2000.[2] The purpose of this study is to assess Wisconsin's progress in reaching this motor vehicle mortality goal, to determine whether motor vehicle mortality trends within demographic subgroups are consistent with overall trends in Wisconsin, and to compare to motor vehicle mortality trends in the United States.

METHODS

Data on injury mortality from 1984 to 1998 were obtained from the Centers for Disease Control and Prevention (CDC) WISQARS™ database, an on-line electronic link to the CDC injury database library.[3] A motor vehicle death is defined as a death that is the result of an injury caused by motor vehicle impact[4] and is a combination of "Motor Vehicle Traffic" (ICD-9 codes E810- E819; E958.5; E988.5) and "Motor Vehicle Accident" deaths (ICD-9 codes E810-E825).[5] The year 2000 objective was set by the Wisconsin Department of Health and Social Services (Transportation Injuries, Objective 1) in 1990.[2]

Trends in mortality were analyzed from 1984 to 1998 for Wisconsin and the United States using direct age-adjustment to the 1980 US population. Trends in mortality were then compared by age group (0-14, 15-24, 25-64, 65-74 and 74+), gender and race (black, white, Asian/Pacific Islander, American Indian/Alaskan Native). Age categories were chosen by grouping similar trends and by using conventional age groups. Racial categories are defined by the CDC WISQARS™ program. The number of annual deaths was too small to calculate reliable rates for the Asian/Pacific Islander and the American Indian/Alaskan Native groups, so these data are not reported.

The reported 1986 and 1996 mortality rates are 5-year averages, from 1984-1988 and 1994-1998 respectively. Similarly, calculations requiring the 1996 population used the 1994-1998 average annual population. Combining 5 years of data increased the stability of the mortality rates for the subgroups. We estimated the change in the number of motor vehicle deaths in the state using indirect age standardization. To determine the number of "expected" deaths, we multiplied the average 1986 age-specific rates by the average age-specific Wisconsin population in 1996. To determine the number of "observed" 1996 deaths, we averaged the deaths from 1994-1998. Lives saved or lost is the difference between observed and expected deaths. Because the data were derived from the whole population, we did not apply statistical testing.

RESULTS

From 1986 to 1996, the overall motor vehicle-related mortality rate has declined from 17 to 15 per 100,000 population (Table). This represents a 12% decline in

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Table. Wisconsin trends in motor vehicle mortality by gender/age and gender/race, 1986–1996. Rates are per 100,000 population.

	1986 Rate	1996 Rate	Percent Change (%)	Observed Number of Deaths	Expected Number of Deaths	Lives Saved (Lost)
GENDER/AGE						
Men*	24.6	20.8	-15	502	599	97
0-14 years	6.2	5.0	-20	28	35	7
15-24 years	51.2	36.2	-29	134	189	55
25-64 years	22.6	19.7	-13	258	297	39
65-74 years	21.2	19.4	-8	32	35	3
75+ years	36.2	42.1	17	50	43	(7)
Women*	10.2	10.3	-1	269	268	(1)
0-14 years	4.9	4.1	-17	22	26	4
15-24 years	17.4	17.7	2	63	62	(1)
25-64 years	9.2	8.9	-3	118	122	4
65-74 years	12.7	11.8	-7	23	25	2
75+ years	15.6	20.4	31	42	32	(10)
GENDER/RACE						
Men						
White*	24.8	21.1	-15	471	559	88
Black*	15.1	15.8	4	19	19	0
Women						
White*	10.4	10.4	-1	252	251	(1)
Black*	5.5	5.6	1	8	7	(1)
TOTALS						
Wisconsin*	17.3	15.3	-12	774	868	94
United States*	20.0	16.8	-16	43,396	51,333	7937

*Rates are age-adjusted to the 1980 US standard population.

motor vehicle related mortality. The Healthier People 2000 goal for Wisconsin was to reduce the motor vehicle mortality rate to 16 per 100,000 population. Using this criterion, the 2000 goal was met. Over the same time period, there was a 20% decline in national motor vehicle mortality rates (Figure 1). If the motor vehicle mortality rate in 1986 had continued, there would have been 868 motor vehicle deaths in 1996 in Wisconsin. However, in 1996, there were 774 motor vehicle deaths in Wisconsin, saving an estimated 94 lives (Table).

The trend in motor vehicle mortality differs between gender, age and racial subgroups. Men had a greater decline in motor vehicle mortality rates than women, overall, and for all age and racial groups (Table). In fact, there was no change in the mortality rates in women overall. In both genders, motor vehicle mortality increased in persons aged greater than 75 years. The greatest improvement was in children aged 0-14 years. Men aged 15-64 years also had significantly reduced mortality. Figure 2 compares lives saved and lost by gender and age. Lastly, blacks did not appear to share in the mortality benefit seen in whites (Table).

DISCUSSION

Since 1981, we found a progressive decline in motor vehicle-related deaths both in the United States and in Wisconsin. This finding is consistent with other national[6] and Wisconsin[1,7] studies. However, in subgroup analysis of Wisconsinites, this benefit was not seen in women, blacks and in the older age groups.

Other investigators have found that Wisconsin male mortality rates are consistently higher than female's, but the rate of decline in mortality rates for males was twice that of females (13% and 7%, respectively) from 1980-1995.[7] In our data on motor vehicle mortality, we found an absence of decline among women overall. Still, the motor vehicle mortality rate for women is half that of men's.

Although young adult males saw the greatest decline among age/gender subgroups, they continue to have a much higher mortality rate than the other subgroups. Again, these findings are also present nationally.[6] Studies have also demonstrated the increased risk of older drivers.[8,9] The National Highway and Traffic Safety Administration has estimated that, by the year 2030, the number of elderly traffic fatalities will more than triple.[9]

The decline in motor vehicle mortality may be attributed to policy changes (such as seat belt laws,[10] driving age, drinking age, blood alcohol limits, speed limits and helmet laws), technical advances[11] (such as air bags,[12] anti-lock brakes, changes in child safety seats,

Figure 1. Age-adjusted* trends in motor vehicle mortality - Wisconsin and the United States: 1981-1998. Rates are per 100,000.

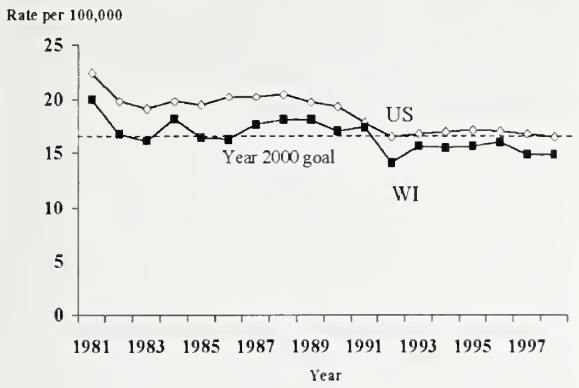
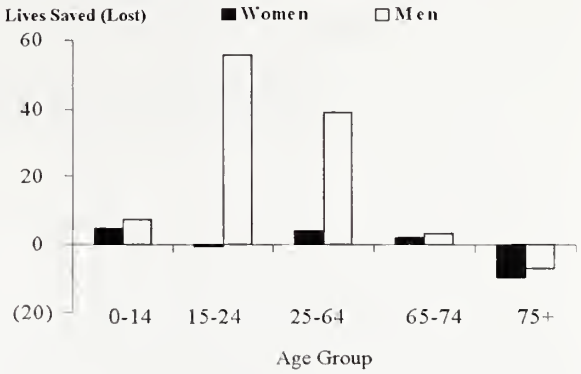


Figure 2. Motor-vehicle related lives lost and saved by age and gender - Wisconsin 1996



improved trauma care[13] and better road design[14]), and changing societal norms concerning behaviors such as drinking and driving and wearing safety belts.[15] The increased mortality in the older age groups may be due to decreasing functional abilities, increased frailty, or different frequency of use of these safety features.[9] Yet, older adults tend to use safety belts more.[16]

There are several limitations to this study. During the past decade, the number of registered vehicles and licensed drivers has been steadily increasing. Adjusting the mortality rates to the vehicle miles traveled actually increases the mortality rate reduction to 31%, from 1986 to 1996.[1] Nationally, also adjusting for vehicle miles traveled, the mortality rate reduction over the same time period was 33%.[6] There may be significant differences in the number of vehicle miles traveled among subgroups in the last decade, and our comparisons did not take that into account.[17] For example, if women had a disproportionate increase in vehicle miles traveled, this may partially explain the gender gap in mortality improvement. However, this explanation is not likely responsible for the increase in motor vehicle mortality among older adults, since they have been found to drive fewer miles than adults in other age groups.[16]

Our study used death certificate data compiled by the CDC as the source of information. The Healthier People 2000[2] document used National Highway Traffic and Safety Administration statistics, and therefore set their objective based on a 1987 mortality rate that differs from the mortality rate we found. Their goal rate was 16% lower than their baseline. The 1996 mortality rate we report is only 12% lower than our 1986 baseline. However, the 2000 mortality rate appears to be approaching a 16% reduction (or a rate of 14.5 per 100,000); see Figure 1.

In conclusion, the overall motor vehicle mortality rate has declined by 12% in Wisconsin, and we have met the 2000 goal. The decline in motor vehicle mortality may be attributed to policy changes, technical advances or changing societal norms. However, the progress of motor vehicle fatalities was not found in women, blacks and those 75 years or older. There is a gap in our understanding of the reasons underlying the lack of progress in these demographic subgroups. This lack of understanding should prompt us to conduct further research for the underlying factors contributing to the progress disparity.

ACKNOWLEDGMENTS

We would like to thank Bruce Aunet, John Cherney and Dennis Hughes, in the Wisconsin Department of Transportation, and Sandy Bonzo at the Centers for Disease Control and Prevention for their helpful information. We also thank Patrick Remington, MD, MPH, our class professor in the Population Health Program, for his guidance. Lastly, we would like to recognize our fellow classmates for their useful suggestions and editorial comments.

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WISCONSIN MEDICAL JOURNAL

Graduated Driver Licensing in Wisconsin: A New Law for Teens and Parents

Gwen McIntosh, MD, MPH; Murray Katcher, MD, PhD

ABSTRACT

The final components of Wisconsin's graduated driver licensing (GDL) statute [Biennial state budget act 1999 Wisconsin Act 9] went into effect on September 1, 2000. The GDL system seeks to reduce the number of teen motor vehicle collisions and fatalities by gradually introducing young drivers to all driving situations, beginning with the easiest and progressing to the more difficult. The stages of licensing are defined by the degree of risk involved. When teen drivers demonstrate the ability to drive safely in a restricted setting with high levels of supervision, they "graduate" to the next licensing level with fewer restrictions.

Numerous factors are associated with the high rate of teen motor vehicle crashes and fatalities. Such factors include driver inexperience and easy distractibility, alcohol use and lack of seat belt use. The GDL addresses all of these risk factors. This article reviews the injury prevention strategies incorporated in the GDL and outlines the basic components of Wisconsin's law.

INTRODUCTION

Motor vehicle collisions are the leading cause of death for adolescents, defined here as those age 15 to 20 years. In 1998, 132 Wisconsin teens died as a result of a motor vehicle collisions.[1] For the nation as a whole, car crashes cause 33% of adolescent deaths.[2] Motor vehicle collisions also represent a significant cause of adolescent morbidity. For each adolescent death due to a car collision, there are 41 hospitalizations and 1100 injuries requiring emergency medical treatment.[3] The GDL seeks to reduce the number of teen motor vehicle fatalities by giving teens a staged introduction to driving skills of increasing difficulty.

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Teens are at greater risk of motor vehicle collision than any other population of drivers. Compared to drivers age 25-29 years, 16-year-old drivers are 7 times more likely to crash (per mile driven).[4] However, older teens have slightly less risk. Seventeen-year-old drivers are 5 times more likely to crash, and 18- to 19-year-old drivers are 2.5 times more likely to crash than 25-29 year old drivers.[4] The data show that the youngest, most inexperienced drivers have the highest crash rates. The higher crash rates result in higher death rates. From 1975 to 1996, the death rate among 16-year-old drivers increased from 19 per 100,000 licensed drivers to 35 per 100,000.[5] In the same time period, the death rate for 17- to 19-year-old drivers decreased from 27 to 25 per 100,000 licensed drivers. The youngest drivers are at greatest risk for motor vehicle collisions and resultant fatalities.

Inexperience with driving skills is one factor associated with high teen motor vehicle collision rates. Safe driving is a skill that requires practice before it is successfully acquired. Prior to 1979, driver's education courses were the only form of driving practice required to obtain a license in the United States. Standard high school driver's education courses provide only 6 hours of behind-the-wheel training. No evidence exists that driver's education classes reduce the number of motor vehicle crashes for teen drivers.[6] In fact, one study showed an increased number of crashes among teens who took driver's education compared with control teens who did not take driver's education.[7] This increased number of crashes is attributed to the concept that driver's education courses encourage earlier licensure of inexperienced youth. The GDL addresses the issue of young driver inexperience by mandating more hours of supervised driving in low-risk situations with direct supervision by an experienced driver. In Wisconsin, teen drivers in the first stage of the GDL system (learner's permit) must complete 30 hours of behind-the-wheel driving that is supervised by an adult front seat passenger who has at least 2 years of driving experience.

Driver error is involved in the majority of teen crashes. For drivers age 16-19 years, an error on the

Table 1. Relative risk of death by age and number of passengers*[9]

	Age of Driver	
	16	17
1 Passenger	1.39	1.48
95% CI	(1.24–1.55)	(1.35–1.62)
2 Passengers	1.86	2.58
95% CI	(1.56–2.20)	(2.24–2.95)
3 Passengers	2.82	3.07
95% CI	(2.27–3.50)	(2.50–3.77)

*Per 10 million trips. From *JAMA* 2000;283:1578-1582.

part of the driver is the cause of more than 74% of fatal crashes.[8] Teenagers lack driving experience and are more likely to engage in risky driving behavior such as speeding, passing improperly or tailgating. More than one-third of fatal teen crashes are associated with speeding.[8] The GDL provides an incentive to drive safely because promotion to the next stage of licensure is contingent upon a good driving record free from any moving violations. The immediate presence of an experienced, adult driver also decreases the likelihood that a teen will engage in risky driving behaviors. Even in low risk driving situations, the adult is present to provide appropriate feedback on the teen's driving skills.

Young drivers are easily distracted from the road. Other passengers in the car are the greatest source of distraction. Carrying passengers in the car is a risk factor for fatal crashes among young drivers. The more passengers in the car of a teen driver, the higher the risk of crash and death (Table 1).[9] The crash rate for teen drivers is four times higher when there are 3 or more passengers in the car and in one-third of all fatal crashes for 16-year-old drivers, 3 or more passengers are present in the car.[10] The GDL addresses this risk factor by limiting the number of passengers allowed in the car of a young driver (Table 2).

Driving is more difficult at night. A high percentage of teen crashes occur at night as inexperienced teens attempt to drive during the more difficult condition of darkness. Forty-one percent of fatal teen crashes occur between 9 p.m. and 6 a.m.[1] The GDL addresses this risk factor by prohibiting the youngest drivers from driving at night without significant adult supervision. The GDL attempts to assure that teens acquire proficiency with night driving skills. Wisconsin law mandates that teens complete 10 hours of nighttime driving under the direct supervision of an adult over age 25 who has at least 2 years driving experience or a qualified driving instructor. In this way, teens are introduced to the complexities of night driving in a closely supervised environment.

Alcohol contributes greatly to the high rate of teen motor vehicle collisions and fatalities. In Wisconsin, 42% of fatal crashes for teens age 15-20 years involve alcohol.[8] Many of these fatalities involve alcohol consumption on the part of the teen driver. In the United States, 21% of teen drivers involved in fatal crashes have positive blood alcohol concentrations.[1] Zero alcohol tolerance is a part of all GDL systems. All 50 states have some form of zero tolerance laws for underage drivers. In Wisconsin, the law mandates absolute sobriety for all underage drivers. Specifically, no driver under the age of 21 years may have a drop of alcohol in their system when operating a motor vehicle. Any teen driver found with a blood alcohol concentration greater than 0.00 will lose their license. The minimum drinking age laws are saving lives. The National Highway Traffic Safety Administration estimates that 18,220 lives have been saved since 1975 because of minimum age drinking laws.[1]

Failure to wear safety belts plays a major role in teen driving fatalities. Twenty-six percent of Wisconsin youth ages 10-24 rarely or never wear safety belts.[11] The failure to wear safety belts results in a significant number of teen deaths. Data from 1997 show that more than 60% of teens who died in motor vehicle crashes were not wearing safety belts.[8] Wisconsin state law requires that the driver and all vehicle occupants wear safety belts at all times while driving in motor vehicle.

As can be seen in Table 2, the GDL requires an increased time commitment to driving supervision and education by parents or guardians. The success of the GDL depends on the support of parents. A recent study in Connecticut found that parents of teens largely support graduated licensing measures. Ninety-one percent of parents favored a mandatory minimum of supervised driving and 82% supported a nighttime driving curfew.[12] Interestingly, teen drivers also accept and support the GDL. In New Zealand, where a GDL system has been in place for more than 13 years, greater than 70% of teenagers support the driving restrictions of GDL.[8] Acceptance of the new GDL law by parents and teens is critical to its effectiveness for preventing teen fatalities.

The one measure parents don't fully support is the restriction of other vehicle passengers. In the United States, only 43% of parents of 17-year-olds support passenger restrictions.[13] For many teens, the opportunity to practice driving skills occur only after school and work when other siblings require transportation to extra-curricular activities. Full restriction of other vehicle passengers could create the difficult situation in which a parent has no time to drive with the teen because they must transport other family members to various activities. The Wisconsin GDL program addresses this issue by lessening the passenger restrictions for teens that graduate to stage 2 [probationary license] of licensure. Teens with a probationary license may have any number of immediate family members

present in the vehicle as long as an adult age 21 with 2 or more years of driving experience is present. By reaching stage 2, these teens have already demonstrated at least 30 hours of safe and controlled driving. The lessening of passenger restrictions allows teens more opportunity to practice the driving skills of slightly increased complexity (e.g. increased number of passengers) with parental supervision.

Graduated driver licensing is an effective strategy to reduce the number of teenage motor vehicle crashes and fatalities. Data from other countries where the GDL system has been in place for 6 to 13 years demonstrate a reduction in teen crashes and injuries. Two studies in New Zealand attribute a sustained 7%–8% reduction in the number teen motor vehicle crash injuries to the GDL program.[14] Results from Canada are more dramatic. A GDL program has been in place in Ontario since 1994. Following introduction of the GDL law, the fatal crash rate for 16-year-old drivers decreased from 6.6 per 10,000 licensed drivers to 1.8 per 10,000, a 73% reduction.[8] Data from GDL programs in the United States also show promising results. In both Maryland and California, the teen crash rate decreased more than 5% following introduction of GDL programs.[8] Since these figures were released, both states have implemented further teen driving restrictions in efforts to continue to reduce teen motor vehicle crashes and fatalities.

The Wisconsin law is a comprehensive measure with many of the recommended components of an effective GDL. It expands the learning opportunities for acquiring safe driving skills by lengthening the licensure process. It promotes increased adult supervision of young, inexperienced drivers. It improves driving proficiency by allowing teens to obtain critical driving experience in low-risk, controlled circumstances. It rewards good driving behavior by graduating safe, skilled drivers to more advanced stages of licensing with fewer restrictions. The GDL system demonstrates wide acceptance among parents and teens. Most importantly, the GDL reduces the rate of teen motor vehicle crashes and prevents teen fatalities. The GDL program is new to Wisconsin; careful data analysis in future years will be needed to evaluate the full effectiveness of a graduated licensing system for our teens.

For additional information about the new graduated driver licensing law, visit the Wisconsin Department of Transportation web site at: www.dot.state.wi.us/dmv/GDLchanges.html

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Table 2. The Wisconsin Graduated Drivers License System

Stage I: The Learners' Permit (6 months duration)

Eligibility Requirements
- Must be at least 15 years and 6 months of age
- Must be enrolled in or complete driver's education course
- Must pass vision and written exam at the DMV
- Must have adult sponsor sign permit application

Restrictions
- If less than 16 years of age, must be accompanied by a qualified driving instructor or a parent/guardian with ≥2 years of driving experience who holds a valid license
- If age 16 years or more, must be accopmanied by a qualified instructor or another person holding a vaild license with ≥2 years of driving experience
- No other passengers allowed except one back seat passenger ≥25 years with ≥2 years of driving experience who holds a valid license
- No driving after the hours of darkenss unless accompanied by a front seat passenger ≥25 years of age with ≥2 years driving experience

Stage II: The Probationary License (2 years duration)

Eligibility Requirements
- Must have had learner's permit for at least 6 months
- Must have successfully completed driver's education course
- Must have accumulated 30 hours of supervised driving experience that must include 10 hours of nighttime driving
- Adult sponsor must certify completion of supervised driving hours
- Must pass road test at the DMV
- Must not have any moving traffic violations within the past 6 months

Restrictions: *in place for first 9 months or until reach age 18*
- May drive alone anywhere from 5 a.m. to midnight
- May have any number of immediate family members as passengers
- Must have at least one person ≥21 years of age who has ≥2 years of driving experience
- May have one additional passenger beyond those described above
- May only drive between midnight and 5 a.m. if traveling between work/school and home or if accompanied by someone ≥21 years of age with ≥2 years of driving experience whoh holds a valid license (Note that the same passenger restrictions listed above apply to nighttime driving, e.g. any number of immediate family members may be present)

Drivers who remain free of any traffic convictions during the first nine months of the probationary license will then be able to drive anytime and with anyone for the duration of their probationary license. All restrictions at stage I or II will be extended if the teen driver is convicted of any moving traffic violation. Violation of any restriciton will result in license suspension or revocation.

Stage III Regular License

Eligibility requirements
- Must have held probationary license for ≥2 years
- Must be at least 19 years of age

No restrictions

Fatal Injuries in Adolescents

Gwen McIntosh, MD, MPH, and Megan Moreno, MD

ABSTRACT

Injuries are a major cause of morbidity and mortality among adolescents. Adolescents routinely experiment with high-risk behaviors, increasing their risk of injury. Major modes of injury in adolescents include motor vehicle collisions, drowning, suicide and homicide. This article reviews the risk factors for fatal injuries in adolescents and discusses current prevention strategies. Previous research identifies many risk factors associated with adolescent injuries. Practitioners can help prevent teen injuries by screening all adolescent patients and identifying those at high risk of injury. Patients at high risk need preventive counseling and evaluation for possible referral to other services. Current strategies are useful in preventing many injuries; however, further research is needed to evaluate these strategies and to design new prevention programs.

INTRODUCTION

Unintentional injury is the number one cause of death in children and adolescents. One adolescent dies every hour as the direct result of injury.[1] In Wisconsin, the number of deaths due to unintentional injury for those age 15 to 24 years exceeds the number of deaths from all other causes combined.[2] The Figure depicts the leading causes of death for teens and young adults in the United States. The intentional injuries of homicide and suicide are the second and third leading cause of death in teens, respectively. Preventing these injuries is a critical challenge for today's health care providers. This article reviews the major types of fatal injuries seen in the adolescent population and identifies risk factors associated with these injuries. Injury prevention strategies for each type of injury are presented.

Adolescents have a high injury rate because they routinely experiment with high-risk behaviors. Factors contributing to the high rate of risk-taking behavior include the developmental drive for independence and autonomy, decreased parental supervision, pressure to engage in risky behaviors valued by peers, lack of experience and feelings of invincibility.[3] The same factors cause difficulty with the implementation of effective injury prevention programs for teens.

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MOTOR VEHICLE

Table 1 summarizes leading causes of unintentional injury death for adolescents in Wisconsin and the United States. Death due to a motor vehicle collision is the leading cause of mortality in adolescents. Motor vehicle-related injuries cause more than 75% of the unintentional deaths seen in Wisconsin's older teens and young adults.[2] The motor vehicle data from Wisconsin closely reflect the national statistics for these age groups.

Adolescents experience a high rate of motor vehicle associated mortality for a number of reasons. Wisconsin adolescents are less likely to use seatbelts than adults. Twenty-six percent of Wisconsin teens report that they "rarely or never" use safety belts, compared with national data in which 16% of teens say they "rarely or never" wear safety belts.[4] Failure to use safety belts can be lethal. Up to 60% of young drivers involved in fatal crashes were not wearing their seat belts.[7]

Inexperience with driving skills also contributes to the high rate of motor vehicle crashes in adolescents. The risk of a collision is greatest during the first two years of driving.[6] Teenage drivers are more likely to speed, make illegal turns and run red lights than experienced drivers. This inexperience is more of a problem at night. Forty-one percent of fatal motor vehicle collisions involving teen drivers occur between 9 p.m. and 6 a.m.[5]

Alcohol intoxication contributes significantly to the high rate of adolescent motor vehicle collisions and fatalities. Alcohol is involved in 42% of fatal adolescent motor vehicle crashes.[6] Adolescents often lack good judgment about drinking and driving. In Wisconsin, 38% of teens report riding in a car with a drunk driver within the past 30 days.[4] Although this number has declined slightly during the past decade, teens continue to combine alcohol intoxication with driving.

Finally, gender plays a significant role in all injury types. The death rate for teenage male drivers is more than twice the rate for teen female drivers.[6] Male adolescents require special attention and counseling on injury prevention.

Prevention strategies to reduce teen car crashes include restricting night driving and increasing the hours of driving experience required for full licensure. This intervention, called graduated driver's licensing (GDL) is in place in 24 states, including Wisconsin. Preliminary data indicate that these restrictions on adolescent drivers result in a reduction in teen motor vehicle crashes and fatalities.

Injury prevention strategies such as the GDL and broad advertising campaigns on the dangers of drunk driving are beginning to effect a change in the driving behavior of adolescents. The number of motor vehicle associated fatalities for children and teens has decreased 40% over the past two decades.[8] Health care providers may continue to contribute to this decrease in a number of ways. In the office, providers can counsel adolescent patients on the dangers of drunk driving and the failure to use seat belts. This counseling should include a substance abuse screen. On a state level, providers can advocate for the passage of GDL laws. With the GDL now enacted in Wisconsin, health care providers can serve as a resource for educating teens and parents about new license requirements (*see related article "Graduated Driver Licensing in Wisconsin" p. 33*). By employing knowledge of the risk factors associated with adolescent motor vehicle related mortality, providers can help state and national agencies design and evaluate further injury prevention strategies.

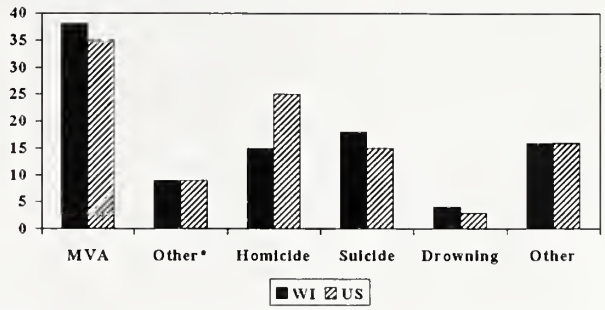
HOMICIDE

Homicide is the third leading cause of death for those age 10-24 years in Wisconsin; it is the second leading cause of death for this age group in the United States. The teen homicide rate has tripled in the past 40 years.[9] From 1993 to 1995, more than 240 teens and young adults in Wisconsin died as a result of homicide, 82% of these homicides involved the use of firearms.[2] Homicide in adolescents is a problem unique to the United States. The homicide rate for children less than age 15 in the United States is 12 times the combined rate of 25 other industrialized countries.[10] Adolescent homicide is an epidemic in our country that requires immediate attention.

Firearms are the single greatest risk factor for homicide. Adolescents often have easy access to firearms. A survey of rural and suburban youth showed that 48% of male teens owned a gun and 11% of eighth grade urban students owned guns.[11] For those adolescents who don't already own a gun, access is not limited. One third of teens polled who did not own a gun stated they could get a gun "if they wanted."[11] Guns are often readily available in the homes of teens. Twenty-eight percent of families who receive care in pediatric clinics keep guns in the home.[12] In 39% of these homes, the guns are unlocked, loaded or both.[12] Presence of a gun in the home is associated with a 3.4-fold increase in risk of adolescent homicide.[8]

Risk factors for adolescent homicide are summarized in Table 2. A few risk factors merit further discussion. Alcohol plays a large role in teen homicide. More than 40% of homicide victims age 15-24 have positive blood alcohol levels.' Male gender denotes an increased for homicide, with male adolescents being 5 times more likely to die of homicide than females.[1] There are numerous opportunities for health care providers to participate in homicide prevention strategies. As indicated in the American Academy of Pediatrics (AAP) policy statement on firearms and adolescents, prevention begins with office counseling.[13] Health care providers can improve their screening for the presence of firearms in the home; pediatricians currently discuss gun safety with only 11% of their patients.[12] Providers

Figure. Leading Causes of Death in the United STates.Ages 10–24 Years



*Other defined as other unintentional injuries.
Source: Center for Disease Control and Prevention: Leading Causes of Death, United States, 1993–1995.

Table 1. Cause of Death Due to Unintentional Injury*

	Type of Injury			
	Motor Vehicle Collision	Drowning	Firearm	Fire/Burn
Wisconsin Deaths				
Age 10–14	45	11	5	4
(%)	(45%)	(12%)	(5.5%)	(4.4%)
Age 15–24	606	40	14	13
(%)	(78%)	(5%)	(2%)	(1.7%)
US Deaths				
Age 10–14	3243	702	392	289
(%)	(57%)	(12%)	(7%)	(5%)
Age 15–24	31,310	2280	1558	681
(%)	(75%)	(5.5%)	(3.7%)	(1.6%)

Source: CDC National Vital Statistics System, NCHS, Ten Leading Causes of Death, 1993-95.
* Percent total of all deaths due to unintentional injury.

Table 2. Risk Factors for Adolescent Homicide

Family Factors	Social Factors
Firearm in home	Ethnic/linguistic heterogeneity
Low income	Crowded housing
History of domestic violence	Racial intolerance
Teenage parent	Lack of adult supervision
Divorce	Social acceptance of violence
Personal Factors	**Psychological factors**
Male gender	Depression
Alcohol/drug use	Antisocial behavior
Poor impulse control	Conduct disorder
Previous gunshot injury	Aggression
Minority race	

Table 3. Risk Factors Associated with Adolescent Suicide

Personal Factors	Psychological Factors
Alcohol/drug use or abuse	Depression
Homosexuality	Conduct disorder
Physical/sexual abuse	Bipolar disorder
Chronic illness	Psychosis
Previous suicide attempt	Schizophrenia
Family Factors	**Antecedent Event Factors**
History of substance abuse	Recent death of family/friend
Suicide in first degree relative	Romantic conflict/break up
History of domestic violence	Divorce
Family conflict	School failure
Firearm in home	Remarriage

Social Factors
Alternate living situation (juvenile detention, group home)
Media coverage of suicide (cluster suicides)
Social isolation
Alienation
Peer rejection

should ask all families about the presence of firearms in the home, provide counseling on the risks associated with firearms and advocate for the removal of guns from the home. For families where this is not acceptable, parents should be encouraged to store all guns unloaded and locked, and ammunition should be locked in a separate place. Reducing adolescent access to guns will decrease the teen homicide rate. Families can be counseled to minimize a child's exposure to gun violence in the media. Parents can also have a major effect on children and teens by teaching them nonviolent methods of conflict resolution.[14] Health care providers should seek to identify and refer high-risk patients, such as those with a substance abuse problem or a previous history of aggression.

Homicide prevention measures have not been well established or researched. Health care providers need to assist with the design and evaluation of homicide prevention strategies. At a state and national level, providers can reduce teen homicide mortality by lobbying for passage of legislation to reduce teen access to handguns and alcohol. Restriction of access to guns could save an estimated 286 adolescents from homicide and 896 adolescents from suicide each year.[8] Although some advocate the use of gun safety classes in place of restricted gun access, no published research confirms the effectiveness of gun safety training for teens or for young children.

SUICIDE

Suicide is the second leading cause of death for Wisconsin teens and the third leading cause of death for all teens in the United States. From 1993-1995, over 300 teens in Wisconsin committed suicide.[2] Risk factors associated with adolescent suicide are summarized in Table 3.

The number of adolescent deaths due to suicide continues to rise. The rate of adolescent suicide increased over 300% in the last 40 years.[15] Guns are a very lethal method of attempting suicide. In Wisconsin, the majority (66%) of completed teen suicides involve firearms.[2] The presence of a firearm in the home increases the risk of suicide among teens 10.4-fold.[8] This is a significant risk as more than 50% of homes in the United States now contain some type of firearm, giving adolescents easy access to a lethal means of suicide.[16]

Alcohol plays a large role in teen suicide. More than 50% of adolescent suicides involve alcohol use.[17] Gender also plays a significant role; adolescent males are at increased risk of suicide completion. The suicide rate for teenage males is 5 to 6 times the rate for females.[17] Although adolescent females make more suicide attempts, males have a higher suicide completion rate because they tend to use more lethal methods, such as firearms.

Adolescents show a high recurrence of suicidal behavior. Forty percent of teens that survive a first suicide attempt make a second attempt within 2 years.[18] Appropriate treatment and follow up are critical to suicide prevention, yet adolescents have a high level of noncompliance with outpatient treatment recommendations after a suicide attempt. After evaluation in the emergency room for a suicide attempt, 16% of patients never followed through with any outpatient treatment; 52% of those who did seek outpatient treatment stopped after 2 sessions.[19]

Strategies to prevent teen suicide have been reviewed by the CDC and classified into 2 prevention program categories.[20] The first category consists of programs to identify suicidal adolescents and refer them to mental health care. Examples of such programs are general screening programs, programs to train school and community personnel, crisis centers and suicide hot lines. The second category consists of strategies to address known risk factors for adolescent suicide. Examples of such programs include peer support programs for high-risk teens, programs to teach stress management skills and programs to promote self-esteem. Few prevention programs attempt to restrict access to the means of committing suicide (e.g.,

firearms). Unfortunately, no current programs demonstrate significant success in preventing teen suicide. All such programs should undergo thorough evaluation before widespread use because some suicide prevention programs may actually result in an increased risk of suicide.[21]

The AAP provides recommendations for health care providers dealing with suicidal adolescents.[16] Health care providers should know the risk factors associated with adolescent suicides that are summarized above. Providers should screen adolescents for risk of suicide at all routine exams and ask if a firearm is present in the home. Providers should be familiar with local and state resources for helping suicidal adolescents. Finally, providers should take an active role in arranging appropriate follow up for suicidal teens and assuring that teens keep these critical follow up appointments. Further research is needed to evaluate the effectiveness of the current suicide prevention strategies.

DROWNING

Drowning is a significant injury problem among adolescents. From 1993 to 1995, more than 3100 teens and young adults drowned in the United States, which makes drowning the second leading cause of unintentional death in those under age 20 years.[2] Water submersion is a lethal injury for teens. Thirty percent to 50% of pediatric victims die following a submersion injury.[22] Despite the magnitude of the problem, few interventions to prevent teen drowning have been investigated.

Several risk factors are associated with adolescent drowning. One factor is the increase in risk-taking behavior that occurs during adolescence. Teens dare each other to swim further, dive deeper, stand up in a canoe or indulge in other behaviors that increase the risk of drowning.[23] Failure to use life vests while swimming and boating contributes to adolescent drowning. Only 13% adolescents routinely wear a life vest.[22] Wisconsin is one of 30 states with laws requiring children younger than 12 years to wear life vests while in boats, but these laws are variably enforced. No Wisconsin law requires the use of life vests for those over age 12 years while in boats. Encouraging teens to wear US Coast Guard approved life vests that fit them properly can help save lives.

Some teen drowning deaths are associated with hyperventilating before attempting to swim long distances under water. This practice is extremely dangerous because loss of consciousness secondary to hypoxia may precede the onset of hypercapnea that would normally causes the teen to surface above the water to breathe.[24] Teens should be counseled to avoid this risky practice.

Alcohol contributes significantly to teen drowning. Adolescents frequently combine water activities with alcohol. Up to 50% of adolescents who drown have a positive blood alcohol level.[22] Laws that prohibit operating a boat while intoxicated exist in all 50 states, but they are variably enforced. Lastly, males are a high-risk population for drowning. Male adolescents are 6 times more likely to drown than female adolescents.[22] For unknown reasons, African American males have a much higher risk of drowning than white males.

Children with epilepsy constitute a population at high risk for drowning. Children and adolescents with seizure disorders have a 13-fold increase in risk of drowning.[22] All teens should be warned never to swim alone, but this point should be strongly emphasized to patients with epilepsy and their parents.

Basic measures to prevent teen drowning can be implemented by health care providers. The AAP policy statement on drowning enumerates specific recommendations for the prevention of drowning in adolescents.[25] Office-based counseling of teens should emphasize the importance of wearing life vests, abstaining from alcohol when swimming and boating, avoiding hyperventilation while swimming, and swimming with appropriate supervision. Providers should identify high-risk patients that require extra counseling on water safety, such as male teens and patients with epilepsy. Outside of the office, health care providers can promote regular enforcement of "driving under the influence" boating laws and efforts to limit teen access to alcohol. Finally, more research is needed to design and evaluate strategies to prevent teen drowning.

SUMMARY

In summary, injury is the major cause of death for adolescents. Alcohol and firearms contribute significantly to all major types of adolescent injury. Efforts to limit teen access to alcohol and firearms will decrease the adolescent mortality rate. Basic prevention begins in the office with injury prevention counseling. A recent study found that only 39% of families received injury prevention counseling during a medical visit.[26] Health care providers need to include injury prevention as a routine part of anticipatory guidance counseling for all patients and families. Finally, further research is needed to evaluate the effectiveness of current adolescent injury prevention strategies and to design new prevention programs.

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Preventing Animal Bites in Children

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ABSTRACT

Domesticated animals have become an increasingly important part of our human experience. Children today are likely to experience daily interactions with animals within their neighborhoods and homes. These animals can provide children with companionship, the opportunity to learn responsibility and respect for life. Yet they can also present children with the potential for injury under certain conditions. Almost half of all children will suffer an animal bite at some time during their childhood, and over 15% of these bites will require medical care. This article will discuss the circumstances leading to most domesticated animal bites, provide advice to the practitioner in helping families choose kid-friendly pets and provide guidance in promoting safe interactions with animals. A future article will review the management of animal bites, including wound care, antimicrobial prophylaxis and the treatment of infected bite wounds. Doctor Corden's article in this issue (p. 43) addresses the role for rabies prevention in animal bites.

INTRODUCTION

Almost half of all Americans will suffer a bite at some point during their lifetime.[1] Dog bites alone result in more than 750,000 ED visits, nearly 6000 hospitalizations and 20 deaths annually.[2,3] This places them among the top causes of nonfatal injuries in the United States.[4] Children account for the majority of these injuries. At least 10% of bites require wound closure and up to 7% require hospitalization, with an average length of stay of 4 to 6 days.[5-7] Excluding deaths, annual cost estimates of ED visits and hospitalizations exceed $200 million.[5]

In 1989-1991, 3926 animal bites were reported to the Milwaukee Department of Health.[9] The mean annual dog-bite rate was 171 bites per 100,000 people. Of these bites, 83% were by dogs, 16% by cats and 1% by bats, raccoons and other wild animals. In 1994-1999, animal bites resulted in 1358 Wisconsin hospitalizations.[8] One-third of these bites occurred in children. Dog bites accounted for 55% of these hospitalizations, 40% were the result of bites from smaller animals (e.g., cats, rodents) and 5% were from the bites of reptiles and arthropods (e.g., snakes, lizards, spiders).

There are many factors that play important roles in children being at high risk for animal bites. Children often have not learned the appropriate approach to an animal and may inadvertently challenge or invade its territory.[10] Their curiosity, playfulness and occasional tendency to tease can be misinterpreted by an animal as a threat to its safety or dominance status. A child's short stature places them in close proximity to an animal's face and may encourage the animal to act dominantly towards them. In addition, their small size and underdeveloped motor skills make it difficult for them to defend themselves.

DOG BITES

Dog bites make up 90% of all animal bites.[1] Each year, an estimated 1.8% of the US population is bitten by a dog, for a total of 4.5 million dog bites.[2] Despite children making up only 20% of the general population, they account for half of all dog bites.[11] The majority of these dog bites occur in boys 5–9 years old, during the spring and summer months.[11-13] One-third to one-half of all bites are provoked, and more commonly occur when a dog feels threatened.[6,12] Dogs can be provoked to bite when they are in pain, are fearful or have their territorial boundaries violated. Attacks by stray dogs are rare, as they lack a territory to defend.[6] Unprovoked bites most commonly involve large, young male dogs who are not neutered.[6,11,14] Biting dogs are more likely to reside in homes with more than one child and to be chained or confined at the time of the bite.[11] Most bites are inflicted by the family pet or neighbor's dog,[5,6] with up to 90% of bites in children under 4 years occurring in their own home by their pet dog.[2,13] Dogs have powerful jaws and large, somewhat dull teeth that are capable of inducing significant crush injury. Dog-bite injuries also include scratches, punctures and tissue avulsion. Severe dog bites most often involve young

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Table 1. Dogs Generally Seen as Gentle Breeds

Large Dogs	Small Dogs
Bearded collie	Beagle
Border collie	Bichon frise
Boxer	Boston terrier
Collie	Cairn terrier
English springer spaniel	Jack Russell terrier
French bull dog	Norfolk terrier
Golden retriever	Norwich terrier
Greyhound	Pug
Labrador retriever	Sheltie
Standard poodle	Toy poodle
	Yorkshire terrier

Adapted from Committee on Injury and Poison Prevention.[29]

male children and have an alarmingly high rate of head and neck injuries.[7] Bites in older children are more likely to involve an extremity, as they are often interacting with the dog at the time of injury and use their extremity in defense.[13] Dog bites can become infected in up to 20% of cases; rates as low as 2% are seen in bite wounds that are easily irrigated and debrided.[15]

Dog-bite fatalities

Dog bites cause approximately 20 deaths per year in the United States, with the majority occurring in children.[16] In infants, attacks are unprovoked and often occur while infants are sleeping. Almost 3/4 of dog-bite fatalities occur on the owner's property, with more than half involving an unrestrained dog.[14,16] Of the dogs who were off the owner's property, more than half had escaped from some form of restraint. In children, most fatalities involve large, unneutered male dogs.[14] The five most frequently reported breeds, in order, are Pit bulls, Rottweilers, German shepherds, Huskies and Malamutes.[16] Other breeds reported include Dobermans, Chows, Great Danes, St. Bernards and Akitas. Despite these breeds making up the majority of fatal attacks, over 25 breeds have been involved in 238 fatalities over the past 20 years.[18]

CAT BITES

An estimated 400,000 cat bites occur in the United States each year[19] accounting for 5%-15% of all animal bites.[15] More than half of cat bites occur in children, with the majority in girls under 6 years.[20] Most bites involve young cats who are known to the child and are unrestrained off the owner's property.[21] Bites can occur when a child is picking up a cat, petting it or when a cat perceives a situation as potentially harmful. Almost 3/4 of cat bites are to the upper extremities, most commonly to the hand.[21,22] The majority of head and neck injuries involve orbital and periorbital tissues.[22] In contrast to the small percentage of dog bites that become infected, up to 50% of cat bites will do so. Cats have sharp teeth that are capable of causing puncture wounds with deep inoculation of bacteria. These puncture wounds are difficult to irrigate adequately and subsequently result in a higher risk of infection.[1,20] The sharp teeth of cats are also capable of penetrating bones and joint capsules and can lead to osteomyelitis, septic arthritis or tenosynovitis.

FERRETS

It is estimated that over a half million US households contain ferrets.[23,24] Despite their small size, ferrets can incur significant injuries with their quick and sharp teeth. In a report of ferret bites in Wisconsin, nearly one-third of bites involved children less than 10 years old, and more than 1/4 were in 10–19 year olds.[26] Ferrets are attracted to the smell of milk, leading to a higher attack rate seen in infants.[23,26] Ferret bites are almost always unprovoked, induce multiple puncture wounds and lacerations, and most often involve the head and neck. In infants, more than 25% of their head and neck injuries require plastic and reconstructive surgery.[27] Most bites occur in a household other than the victims, where ferrets are allowed to wander freely without adult human supervision. Yet, bites by ferrets also have occurred after they escaped from their cages.[24]

PREVENTION STRATEGIES

Anticipatory guidance for parents

Parents should serve as good role models for their children by respectfully caring for their pets and providing good medical care. Animals should be spayed or neutered to reduce the likelihood of aggression. In addition, animals should be adequately immunized against rabies. Current laws exist for rabies vaccination in dogs, but not in cats. It is as important to vaccinate cats, as they have surpassed dogs in positive rabies testing since 1980.[28] In choosing a pet, parents should consider animals known for their gentle nature. Such animals include domestic and purebred cats, certain dog breeds (Table 1), fish, small birds, hamsters, gerbils, guinea pigs and rabbits.[29] Pets should not be chosen if they have a history of aggression or are known for their aggressive personality. Animals should not be kept chained as this predisposes them to aggressive and territorial behavior; yet, they should be kept safely on leashes if they are off the owner's property. Young children should never be left alone with a dog, as dogs sometimes use biting to assert dominance and teach a child to be submissive. Ferrets should not be chosen as pets if there are small children in the home. Similarly, small children should never be left unsupervised in other homes where ferrets reside.

Anticipatory guidance for children

Children should be instructed on how to interact safely with animals to decrease their risk of being bitten (Table 2). Adult supervision with any animal-child interaction should be strongly encouraged. Children

should avoid dogs who may act territorial (e.g., when eating, sleeping, caring for puppies or chained). They should never try to kiss a dog as licking and "kissing" are seen as displays of submissive behavior.[30] Children should not perform activities close to dogs that may startle them, such as riding a bike or rollerblading. Children should avoid dogs that are unfamiliar, appear fearful or show signs of aggression. An unsafe dog will demonstrate a staring expression, rigid body in crouched position, stiff tail, hysterical barking and an attempt to circle behind the child. Children should never approach unfamiliar cats and should pay close attention to the clues of an annoyed or unsafe cat (e.g., low wagging tail, ears pointed back, growling).

Anticipatory guidance for pets

Dogs should receive proper socialization and submissive behavior training (e.g., roll over to show stomach, give up food without growling). If a pet is present in the home prior to a child's birth, it should be prepared for the new arrival by introducing the child's clothing or diaper. Dogs may be jealous of these 'newcomers' and the attention they receive. The presence of an adult appears to be a deterrent to attacks in these situations, and underscores the importance of adult supervision.[18] If an animal displays aggressive or undesirable behaviors (e.g., growling, nipping, biting), immediate help should be solicited from a veterinarian or animal behaviorist.

Animal control advocacy

Strong advocacy should be given for animal control programs and laws regulating dangerous or vicious dogs. Strong leash laws are encouraged for all dogs as any dog is capable of aggressive behavior under certain circumstances. While much energy has been directed towards breed-specific approaches to bite prevention, the most effective strategy is to target dog owners. In Wisconsin, the owner of a dog is held criminally negligent and financially liable if measures to restrain a dog are inadequate and the dog injures a person.[31] Leaving the dog in the same environment without behavioral treatment only invites further aggression. Possible post-bite actions include placing the dog with a new owner and providing behavioral training (i.e., desensitization, submission training, positive reinforcement of gentle behavior). Other methods include changing child-dog interactions, secure dog confinement and in certain circumstances, euthanasia.

SUMMARY

Health care providers should inquire about family pets at every well-child visit. This will provide an opportunity to interact with the child regarding something close to their heart; yet, it will also provide the opportunity to discuss the prevention of animal bites. Prevention techniques include parent and child education, behavioral training for animals and animal control advocacy.

Table 2.

Ways to avoid an animal bite

- Do not impinge on an animal's "territory"
- Do not tease, hurt or play roughly with an animal
- Do not try to take an object away from a dog, including a toy
- Never play with an animal unless supervised
- Do not look a dog directly in the eye
- Do not attempt to kiss a dog or hold your face close to an animal
- Never turn your back on a dog
- Do not run, ride a bike or skate in front of a dog
- Never try to break up an animal fight

Meeting a new (or strange) dog

- Never approach an unfamiliar dog
- Look for the signs of an unsafe dog
- Stop, stand still and speak softly
- Allow the dog to sniff you first
- Approach slowly with hand held palm down
- Pivot slowly if the dog tries to circle behind you
- Wait until the dog stops moving, then back away slowly
- Never turn your back towards a dog
- Do not make threatening gestures (e.g., kicking)
- Never run from a dog or scream
- If knocked over by a dog, roll into a ball and remain still

Adapted from Committee on Injury and Poison Prevention.[29]

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Prevention of Choking, Strangulation, and Suffocation in Childhood

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ABSTRACT

Choking, suffocation and strangulation are important causes of unintentional injury and death in young children. Choking on food and toys, suffocation from plastic bags and strangulation from strings on children's items are common causes of mechanical airway obstruction. An effective prevention plan must include education, product labeling, and product and container modification. Health care providers can play an important role in the dissemination of prevention information to caregivers and manufacturers in order to reduce the incidence of these injuries in young children.

In the United States, mechanical airway obstruction from choking, suffocation and strangulation is the leading cause of unintentional injury that results in death of children less than 1 year. It ranks fourth as a cause of death in children 1 to 9 years, surpassed only by motor vehicle injuries, drowning/submersion, and fire/burns.[1] Many of these deaths are preventable. Prevention of death from mechanical airway obstruction has long been a concern of health care providers, whose role may involve education of parents, other caregivers and manufacturers about the risks and the prevention of choking, suffocation and strangulation in children.

Choking is the interruption of respiration by internal obstruction of the airway, usually by food or small toys in young children. Suffocation is obstruction of the airway from an external object that blocks the nose and mouth, such as a plastic bag. Strangulation also results from external compression of the airway from an object, such as a string that becomes caught around the neck.

EPIDEMIOLOGY

Children less than 3 years of age are at greatest risk for mechanical airway obstruction. According to the Centers for Disease Control and Prevention (CDC), the death rate for unintentional suffocation (including inhalation or ingestion of food, objects and accidental mechanical suffocation) from 1981-1998 was 2.96 per 100,000 for children age 0-4 years as compared to 0.36 per 100,000 for those 5-9 years.[1] Suffocation is a leading cause of morbidity in young Wisconsin children, as shown in Table 1. Furthermore, death from airway obstruction is most common in the first year of life. Injury from unintentional suffocation is more common in males than in females.[1] Some progress in the prevention of deaths from unintentional suffocation has been made through federal regulation and public education; the death rate from unintentional suffocation for children 0-4 years has fallen from 3.46 in 1981 to 2.78 per 100,000 in 1998.[1]

Foods, coins and small toys are common causes of choking in young children. Foods, such as hot dogs, hard candy, nuts and grapes (Table 2), account for a substantial proportion of deaths from choking. Children are likely to choke on small, round, pliable objects that conform to the shape of the airway.[2] Coins are a common cause of foreign body ingestions. Among toys, rubber balloons are the leading cause of suffocation, according to Consumer Product Safety Commission (CPSC) injury data. More than 110 children have died as a result of suffocation involving rubber balloons since 1973.[3] In addition, balls, marbles and other small toys intended for use by older children lead to many unfortunate deaths. During a 1-year period, the CPSC received reports of 7 deaths of young children from small balls.[3] Furthermore, any small household items including jewelry, arts and crafts items, small pieces of hardware, paper clips, and ballpoint pen caps are potential dangers (Table 2). Small button-type batteries are a particular concern as they may produce corrosive injury.

Unintentional strangulation often results from strings on clothing or pacifiers that catch on a household piece (e.g., crib posts, furniture or doorknobs) or playground equipment and tightly wrap around the child's neck. According to the CPSC, two to three children under 2 years of age are strangled each year due to strings, cords, ribbons or necklaces around their necks.[3] Window blind and drapery cords as well as wall

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Table 1. Wisconsin Hospital Discharges by Age and Injury, 1990-1999

Age	Drowning/ submersion	Traffic Accident	Suffocation
< 1	34	1	176
1-4	151	17	250
5-9	75	213	54
10-14	42	325	78

Data from the Wisconsin Department of Health and Family Services, Division of Public Health, Bureau of Emergency Medical Services & Injury Prevention. Total hospital discharges for all age groups = 4288.

and crib decorations also have caused strangulation. From 1981-1995, 183 deaths resulted from strangulation by window cords, resulting in a mortality rate of 0.14 per 100,000 for children less than 3 years old.[4] Furthermore, children can be strangled when a heavy hinged toy chest lid catches their necks.

Suffocation of children can occur in an unsafe sleeping or play environment. Approximately 25 children per year suffocate due to plastic bags.[3] Most are dry-cleaning bags or plastic garbage bags used for storage or protection of furniture and bedding. The children suffocate when the plastic bags block the nose and mouth, impairing breathing. Unsafe crib environments and improper sleeping surfaces can also result in suffocation. Between 1985 and 1990, 250 infants suffocated on adult or youth beds.[3] Entrapment and suffocation can also occur in household items, such as refrigerators, ice chests, toy boxes and dryers.

RISK FACTORS

The likelihood that a child will choke depends on the following: the child's anatomy, the developmental stage, the type of food being eaten, the type of objects available and environmental factors.

As described above, children less than 3 years of age are at highest risk for death and injury from mechanical airway obstruction. This is due to their immature anatomy and developmental stage. Young children do not have a fully developed set of teeth for thorough chewing. Children's airways have a smaller diameter, and their swallowing mechanism remains immature and ineffective. Children lack the experience and cognitive skills to avoid choking. They forget to eat slowly and chew well. In addition, young children have a natural tendency to put everything in their mouths. The immature anatomy and lack of sound judgment place children at an increased risk for choking. Inappropriate foods and other objects in the surroundings also increase the risk of choking. As detailed above, foods that are round or cylindrical and pliable or compressible most effectively form an airplug.[2] These danger foods should not be fed to children less than 4 years of age. Of all children's play products, rubber balloons, small balls and marbles are the leading cause of suffocation death. In addition, small household items may be choking hazards.

Environmental factors, such as distractions during eating, can contribute to the risk of choking. Children who eat while rushed, walking, running or laughing may choke. Also, poor parental supervision may contribute. Children need to be reminded to take small bites and chew thoroughly. Children are more likely to choke when fed by a sibling, as food may not be properly cut or inappropriate foods may be given to the younger child. The presence of older siblings in the household increases the risk for choking, since toys with small parts may be more easily accessible.

PREVENTION STRATEGIES

Many deaths from mechanical airway obstruction are preventable. Information regarding the morbidity, mortality, trends and risk factors for choking, strangulation and suffocation can be used by health care providers to reduce the incidence of death and injury. A comprehensive prevention plan includes education, product labeling and product modification.

Education – Information regarding childhood risks for choking, strangulation and suffocation should be distributed not only to parents but also to other caregivers, including day care providers and babysitters. Parents are most easily educated at health supervision visits, according to the child's developmental stage. The Injury Prevention Program (TIPP) of the American Academy of Pediatrics (AAP) provides age-related safety sheets that may facilitate the provider's safety discussion with parents.[5] In addition, community programs can distribute safety information to other child caregivers.

At the newborn and 2-week-old visit, the provider should advocate a safe crib environment. To reduce the risk of suffocation and SIDS, infants should be placed to sleep on their backs. Cribs should conform to the safety standards of the CPSC and American Society for Testing and Materials. Cribs should have a firm, tight-fitting mattress, no missing or defective hardware, properly spaced slats (no more than 2 3/8 inches between slats), and no corner posts or decorative headboard cutouts. Infants should not be placed to sleep on soft bedding, including pillows, quilts, comforters, or sheepskins. Wall decorations, including ribbons and streamers, should be kept away from the sleeping area. Parents should not use makeshift pacifiers or rattles that could break apart and lead to choking. Bibs and other clothing with strings should be removed before placing the child in the crib. Pacifiers, necklaces, toys or other items should not be tied around a child's neck.

At the 4- to 6-month-old visit, choking on foods and household products should be discussed with the par-

ents. Parents should be reminded that infants are beginning to bring objects to their mouths at this developmental stage. Parents should be encouraged to "childproof" their homes by safely storing away small household products and toys that may belong to older siblings. In particular, special emphasis should be given to small balls, marbles, toys with small parts, balloons, pen caps and batteries. Small balls and marbles are commonly found in older children's games, vending machines and as restaurant prizes. Due to their small size, they can easily become lodged in a child's airway. Balls smaller than 1.75 cm should not be available to children less than 3 years old. In general, toys smaller than 3.17 cm x 5.71cm (that fit through a toilet paper tube) should be kept away from young children.[6] Parents can be referred to the AAP handout, "Toy Safety: Guideline for Parents."[5]

Safe foods should also be discussed at the 6-month visit, as finger foods are being introduced into the infant's diet. In general, parents should be advised to not feed infants small, round, firm or pliable foods that may lodge in the airway but rather soft foods that dissolve easily or tiny pieces that do not require chewing. Examples of dangerous foods should be discussed. As listed in the AAP handout "Choking Prevention and First Aid for Infants and Children," dangerous foods include hot dogs, nuts, chunks of meat, grapes, hard candy, popcorn and raw carrots.[5] Furthermore, parents should be reminded that children should eat only while sitting. Food should be cut into small pieces, and parents or another adult caregiver should supervise mealtimes, since some episodes of choking occur when an older sibling is feeding the young child.

Parents and caregivers should be encouraged to learn emergency first aid for the choking infant. Cardiopulmonary resuscitation (CPR) may be lifesaving when initiated immediately by the caregivers of the infant. The AAP recommends parental participation in the American Heart Association's Pediatric Basic Life Support course (800.242.8721) or the American Red Cross's Infant and Child CPR Course (AAP).[7]

At the 9- to 12-month visit, parents should be reminded of the infant's emerging mobility. Infants begin to pull to stand at the side of toy chests with heavy lids and may be strangulated if the lid falls onto them. Lids should be removed or new, safer toy chests should be purchased. More importantly, parents should be warned about the dangers of looped drapery and window-blind cords. Children have reached up and placed the cords around their necks, resulting in strangulation. In 1995, the Window Covering Safety Council announced voluntary industry wide standards that eliminated the loop in the pull cord. Window coverings are now produced with two cords with individual tassels or a single break-apart tassel. For existing cords, the industry recommends cutting the loop and replacing with two tassels. Drapery cords should be tied down to pull cords tight or anchored high out of reach; strangulation from non-loop single cords has been reported. Free consumer brochures and modification kits for looped window coverings are available from the Window Covering Safety Council, 800.506.4636.

Table 2. Common Choking Hazards

Foods	Household Items
Hot dogs and sausages	Coins
Chunks of meat	Toys with small parts
Grapes	Small balls & Marbles
Hard Candy	Balloons
Popcorn	Arts & Crafts materials
Peanuts and Nuts	Ballpoint pen caps
Raw carrot	Watch batteries
Fruit seeds	Jewelry
Apple chunks	

During the toddler and preschool years, providers should continue to counsel parents on the choking risks described above, as appropriate for the developmental stage of the child. Parents should be warned about the suffocation risk from uninflated balloons and pieces of broken balloons. Children can suck a balloon into the mouth and throat while attempting to inflate it and can also suffocate when balloon pieces on which they are chewing are pulled back into the throat. Because of this danger, the CPSC recommends that children under the age of 8 years should not play with balloons without supervision. Children should never be allowed to chew on balloons or their pieces; broken balloons should be disposed of immediately.

Product Labeling – Physicians have long been interested in the prevention of choking, strangulation and suffocation. Child safety acts have been an integral part of this effort. In 1979, the Federal Hazardous Substances Act banned any toy or article intended for children under 3 years of age that presented a choking, aspiration or ingestion hazard because of small parts. The Small Parts Standard of January 1980 stated that toys for use by children under 3 years must meet minimal size requirements. This standard uses a device called the small parts test fixture (SPTF), a cylinder with a 1 1/4 inch (3.17cm) diameter and a sloping floor, giving a depth between 1 inch and 2 1/4 inches (2.54-5.71cm). Any toy that fully fits inside the fixture must be labeled for use by children older than 3 years.[6]

Use of this fixture has been effective in identifying toys with small parts that may lead to injury. A recent study of approximately 140 injury-causing foreign bodies revealed that more than 99% of identifiable foreign bodies fit within the cylinder.[8] However, the SPTF may not be as effective in preventing deaths from choking. An analysis of the types, shapes and sizes of objects causing choking or asphyxiation deaths concluded that 14 of 101 (14%) deaths could have been

prevented if the SPTF had been 4.44 cm in diameter and 7.62cm in length.[2]

The Child Safety Protection Act of January 1995 fixed some of these problems. It stated that any small ball, with a diameter less than 1 3/4 inches (4.44cm) must contain the following label:

> **⚠ WARNING**
> CHOKING HAZARD– This toy is a small ball. Not for children under 3 yrs.

Despite toy labeling efforts, concern has arisen that parents do not understand the intention of labels. The label does not explain why the toy is inappropriate, therefore, parents assume that labeling is informational, and relates to the child's educational level. In a study of 199 toy buyers, 44% said that they would buy a toy for a child between 2 and 3 years old if it was labeled "Recommended for 3 and up," but only 5% would buy it if it was labeled "Not recommended for below 3– small parts."[9] Therefore, more detailed labeling may reduce the purchase of inappropriate toys for children less than 3 years.

Toy-related deaths also occur in children over age 3. Of 449 deaths from aspirated foreign bodies in children 14 years old or younger recorded by the CPSC between January 1972 and January 1992, 35% occurred in children over 3 years of age.[2] (Perhaps toy regulation standards should be extended to children 3-6 years old.)

Unfortunately, actions comparable to those initiated with toys have not been taken with food. As described above, a significant proportion of morbidity and mortality from choking is due to foods. (Perhaps warning labels should be put on foods that pose a significant choking hazard to young children.)

Product Modification – As a result of federal regulation standards, many products intended for use by children have been modified to reduce the likelihood of choking, strangulation and suffocation. For example, cribs now have narrowly-spaced slats and tightly fitting mattresses. Fewer toys with small detachable parts are available. Window blinds now are available with tassels and without loops. Children's clothing is no longer manufactured with drawstrings. Toy boxes are made with safer lids and with air holes for the trapped child. However, further need for product modification remains. Hot dogs could be reengineered in a different shape and consistency that reduce their likelihood to become a plug in the airway. Mylar balloons should be used in place of rubber.

SUMMARY

In order to reduce the incidence of morbidity and mortality from choking, suffocation and strangulation, health care providers should provide anticipatory guidance to parents based on the developmental stage of the child. This can be accomplished effectively through discussion and use of handouts, such as those provided through the American Academy of Pediatrics and its TIPP (The Injury Prevention Program). This information can be disseminated not only at health visits but also through community groups and projects. Federal regulation of cribs, toys and other articles intended for use by children under 3 years has made significant progress in reducing the incidence of choking, strangulation and suffocation. Health care providers, working with organizations such as the AAP and CPSC, can further efforts by supporting changes and expansion of current federal regulations.

RESOURCES

US Consumer Product Safety Commission
Washington, DC 20207-0001
1.800.638.2772 • www.cpsc.gov

The American Academy of Pediatrics
141 Northwest Point Blvd
Elk Grove Village, IL 60007-1098
847.434.4000 • fax 847.434.8000 • www.aap.org

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Rabies Prevention

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ABSTRACT

Rabies is an almost uniformly fatal encephalomyelitis with no treatment option other than supportive care for those who contract the illness. Mortality worldwide is estimated to be 40,000 - 70,000 people annually. Fortunately, public health measures begun in the 1940s and 1950s regarding vaccination and control of domestic animals in this country and the availability of safe and effective rabies postexposure prophylaxis treatment (RPEP) for humans has made rabies a rare disease in the United States. Community healthcare providers continue to play a pivotal role in the prevention of this devastating disease. This article emphasizes the challenges that the evolving epidemiology of rabies presents to our healthcare system, especially regarding international travel, the importance of domestic animal vaccination against rabies, the use and cost of RPEP, recent rabies epizootics in wildlife populations and the role of bats in disease transmission.

INTRODUCTION

Rabies is a disease in which primary prevention is crucial, because contracting the illness leads to an almost invariably fatal outcome. In the United States and in other developed nations, successful public health policy has made human rabies a rare occurrence. Wisconsin has not experienced a human fatality from rabies since 1959,[1] and only 41 deaths have been reported from the disease in the entire country from 1980 through October, 2000.[1-7] This is in sharp contrast to other parts of the world where the World Health Organization estimates the number of deaths caused by rabies to be 40,000-70,000 annually.[8] The foundation for this successful prevention policy began in the 1950s when laws mandating vaccination for domestic animals were instituted. These veterinary vaccination programs led to an almost immediate decrease in human exposure to the virus and a rapid decline in the number of human cases. Additionally, individuals potentially exposed to rabies now have access to a nearly completely effective and safe regimen of rabies postexposure prophylaxis (RPEP) treatment.[9,10]

However, new challenges exist for healthcare providers as the disease continues to evolve in this country. The principal reservoirs of the rabies virus have shifted from domestic to wildlife species since the 1960s, and some areas of the country have experienced rabies epizootics in wild animal populations. Such occurrences threaten to increase human exposure, either directly or via transmission from wild animals to our pets. The usage and resulting healthcare cost of RPEP are increasing, especially in states where these epizootics are occurring, thereby causing a significant financial burden. Bat exposures have become particularly worrisome because bat bites may go unnoticed, leading to an untreated exposure. By staying informed about these challenges, physicians can continue to play an important role in protecting the public from this deadly disease.

TRAVEL

For economic, logistical, and cultural reasons, rabies continues to be a significant problem in many underdeveloped areas of the world. Hyperendemic canine rabies is of particular concern in some developing countries. Of the 41 rabies-related deaths in the United States that occurred between 1980 and 2000, 13 were either known or suspected to be related to dog bites that occurred while the person was outside of the country.[3,6] RPEP therapy in some regions of the world may not be as efficacious, safe or readily available as it is in developed nations. Patients traveling to areas that are known to be endemic for canine rabies should consider preexposure vaccination, especially if immediate access to medical care and safe post-exposure biologics will be limited in their country of destination. Information on the endemicity of rabies in various parts of the world can be found on the CDC's website (www.cdc.gov) in the traveler's health section. Recipients of the pre-

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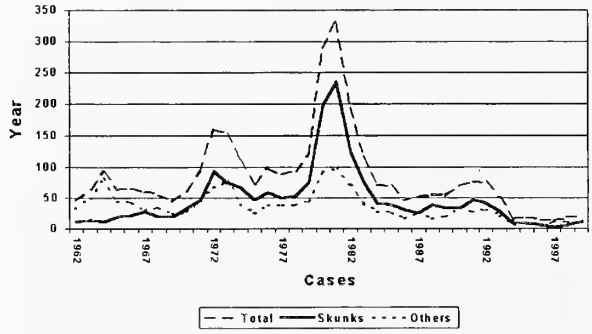
Table 1. Animal Rabies Diagnosed in Wisconsin 1990 – 1999

Year	Domestic Animals					Wild Animals						Combined
	Dogs	Cats	Cows	Horses	Total	Skunks	Bats	Raccoons	Woodchucks	Fox	Total	Total
1990	4	3	10	2	19	35	12	0	2	0	49	68
1991	7	3	9	0	19	48	7	0	0	1	56	75
1992	6	3	7	2	18	43	11	0	0	2	56	74
1993	1	4	4	0	9	28	13	1	0	0	42	51
1994	2	0	1	0	3	10	3	0	0	0	13	16
1995	1	1	2	1	5	9	4	0	0	0	13	18
1996	0	1	1	0	2	8	3	1	0	0	12	14
1997	1	1	3	1	6	2	5	0	0	0	7	13
1998	0	1	0	0	1	8	10	0	0	0	18	19
1999	3	0	0	1	4	13	4	0	0	0	17	21
Total	25	17	37	7	86	204	72	2	2	3	283	369

Figure 1. Animal Rabies in Wisconsin, 1962–1999



exposure vaccination series need to know that an abbreviated course of RPEP is still necessary if they sustain a potential rabies exposure. Such travelers should also be counseled to avoid contact with dogs and if RPEP must be started abroad, to consult with public health officials in the United States about the need for further therapy.[9,10]

DOMESTIC ANIMAL VACCINATION

As a result of housing developments that encroach upon wildlife habitat, the adaptability of certain rabies reservoir species to urban and suburban habitats, and the increasing popularity of outdoor recreation, the risk of human and domestic animal contact with rabies can be expected to persist or even increase during the foreseeable future. This is especially true for areas of the country that are undergoing large wildlife rabies epizootics such as the northeastern states that are confronting a massive raccoon rabies problem. In Wisconsin, the striped skunk is the primary reservoir species of the rabies virus, with bats acting as a secondary reservoir (Table 1). Historically, animal rabies cases in Wisconsin appear to fluctuate on a 10-year cycle (Figure 1); if this trend remains true, a significant increase can be expected to occur within the next few years.

By maintaining a high level of immunity against rabies in domestic animals, particularly dogs and cats, these species can form an immune buffer between humans and wildlife reservoirs of the virus. Wisconsin statute mandates that all dogs must be vaccinated, but there is no stipulation regarding vaccination of cats or other domestic animals. Since 1980, more cases of rabid cats are reported each year in the United States than those involving dogs.[11] All families with pets should be regularly reminded to have their animals appropriately vaccinated—including their cats. Additionally, education of the public (especially children) regarding appropriate behavior around both wild and domestic animals should minimize the potential for rabies exposures (see accompanying article on animal bites p. 39).

RABIES POSTEXPOSURE PROPHYLAXIS (RPEP)

The use of RPEP is the last line of defense in preventing this disease. Fortunately, the RPEP regimen currently recommended in the United States has a very high therapeutic index—being virtually 100% effective and having few side effects[9] (RPEP consist of cleansing the wound with soap, water and virucidal agent such as povidone-iodine; one dose of rabies immune globulin followed by 5 doses of rabies vaccine over a 28-day period). The downside is its cost, estimated to be $2200 per person per treatment course.[12] In some areas affected by wildlife rabies epizootics, both the use and thus cost of RPEP has dramatically escalated. A Massachusetts study found that the use of RPEP increased from 1.7 per 100,000 in 1991 (prior to the introduction of raccoon rabies), to 45 per 100,000 in 1995 (after the epizootic first occurred). The cost of RPEP in Massachusetts was estimated at $2.4 million to $6.4 million during 1995 alone.[13] The onus is on physicians to use RPEP responsibly in order to prevent this fatal disease as well as to keep cost down. There has been concern

Table 2. Rabies post exposure prophylaxis guide – United States, 1999

Animal type	Evaluation and Disposition of Animal	Post exposure Prophylaxis Recommendations
Dogs, cats and ferrets	Healthy and available for 10 days observation	Persons should not begin prophylaxis unless animal develops clinical signs of rabies*
	Rabid or suspected rabid	Immediately vaccinate
	Unknown (e.g., escaped)	Consult public health officials
Skunks, raccoons, foxes and most carnivores	Regarded as rabid unless proven negative by laboratory tests**	Consider immediate vaccination
Livestock, small rodents, lagomorphs (rabbits and hares), large rodents (woodchucks and beavers) and other mammals	Consider individually	Consult public helath officials. Bites of squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, other small rodents, rabbits and hares almost never require antirabies post exposure prophylaxis

*Clinicians should contact local health oficials to insure the biting animal is appropriately quarantined and observed. During the 10-day observation period, begin post exposure prophylaxis at the first sign of rabies in a dog, cat or ferret that has bitten soemone. If the animal exhibits clinical signs of rabies, it should be euthanized immediately and tested.

**The animal should be euthanized and tested as soon as possible. Holding for observation is not recommended. Discontinue vaccine if immunofluorescence test results of the animal are negative.

Source: Adapted from [9]

that the increased use of RPEP is a result of inappropriate use outside of accepted guidelines. However, the only prospective study to evaluate this concern showed that there was actually a greater percentage of patients who did not receive prophylaxis but who met guideline criteria than patients who received RPEP inappropriately.[14] This should demonstrate to clinicians the importance of understanding and implementing current guidelines (Table 2) and the need for further research to establish new criteria that continue to protect the public yet hopefully reduce the use of RPEP and resultant healthcare costs.

Clinicians are encouraged to notify local public health agencies to ensure that animals that bite humans are appropriately quarantined or tested, thus obviating the need to consider RPEP in most cases. State and local health officials can also be consulted whenever questionable cases occur (Wisconsin Division of Public Health, Communicable Disease Epidemiology Section at 608.267.7321).

BATS

Bats pose their own unique challenge in assessing a potential human exposure to rabies. Of the 31 deaths due to rabies over the past 10 years, 23 have been attributed to bat variants of the rabies virus. Of these 23, only 2 case-patients had a definite history of a bite.[1-7,15] These data suggest that it is possible for a bite or scratch from a bat to go unnoticed or appear so insignificant that the patient fails to recall it.[16-18] Because of these "cryptic" exposures to bat rabies, recommendations for prophylaxis after bat contact have been revised and made more aggressive. RPEP is without question indicated whenever direct contact between a bat and human occurs, and a bite or scratch cannot explicitly be ruled out, unless the bat is captured and proven to be rabies negative. The need for RPEP when a bat is merely encountered indoors can be more difficult to assess. Current recommendations state that RPEP can be considered for persons who were in the same room as the bat but were potentially unaware that a bite or direct contact had occurred — examples: a sleeping person awakens to find a bat in the room or an adult witnesses a bat in the room with a previously unattended child, mentally disabled person or intoxicated individual.[9]

Although such recommendation are reasonable, caution must be taken to avoid taking these guidelines to an extreme; just being in a room with a bat does not in itself constitute an exposure for a conscious mentally competent adult or older child, nor is RPEP indicated for other members of a household just because probable contact occurred elsewhere in the home.[9,16] In all cases, every effort should be made to safely capture the animal with its head intact for testing, definitively confirming whether RPEP is indicated. Local and state public health officials can be of assistance in getting such specimens tested.

Although contact with bats should always be avoided and bats should be excluded from human living areas, it is important to realize that the vast majority of the bat population is not infected with rabies. The indiscriminate destruction of bat populations is not only ineffective from a public health perspective, but can result in serious ecological damage.[19]

SUMMARY

The majority of healthcare providers will never see a case of rabies in their careers, but if this is to remain true, they must continue to play an active role in the prevention of this disease. Because there is no cure for the disease, rabies is truly an entity where prevention is

paramount. Individuals traveling to certain underdeveloped countries should consider receiving pre-exposure vaccinations against rabies and be warned that a rabies threat exists, especially from contact with dogs during their visit. Families should be reminded of the importance of vaccinating their pets so that a domestic animal barrier is maintained between humans and the growing wildlife population infected with this disease. Physicians need to be familiar with the most recent rabies prevention guidelines so that no true exposure goes untreated, yet the unwarranted use of RPEP is avoided — a difficult balancing act, considering the likely outcome of a true infection. People need to be better informed about the risks presented by indoor bats, while homeowners and landlords should be encouraged to bat-proof their dwellings. The public, particularly children, should learn that any contact with bats should be avoided, and should report exposures to their healthcare providers or local public health department so appropriate steps can be taken.

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APPENDIX

i. Since the acceptance of this manuscript, a resident of Sauk County, WI was diagnosed with and died of rabies during the month of November, 2000. It appears the disease was transmitted during a bat exposure.

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Farm Injuries in Children: A Review

Gregory P. DeMuri, MD, and Mark A. Purschwitz, PhD

ABSTRACT

Farming is one of the most dangerous occupations in the United States. Unfortunately, risk of injury and death extends not only to adults, but to children that live, play, and work on the farm. This article reviews the epidemiology, pathogenesis and prevention of farm injury in children and adolescents. In Wisconsin 39 children were killed in the agricultural setting between 1995 and 1999. Nationwide, over 100 children per year are killed and 27,000 injured on farms. The age distribution of injury in children is bimodal, with one peak at 3-4 years of age and a second peak at 13-16 years. Boys are much more likely to be injured on the farm than girls. Of the agents associated with the injury of children, tractors are most commonly implicated and are the most deadly. Drownings, injury by cows and horses, and other farm implements and machinery make up the remainder of most farm accidents. The head and face are the sites involved in preschoolers whereas the limbs are more likely to be injured in older children. Poor supervision, unreasonable expectations, financial difficulties and lack of safety devices are associated with risk of injury. Prevention or injury involves patient and family education, regulation and safety devices. Important resources are available for farm families and health care providers to prevent farm accidents in children.

INTRODUCTION

Each year in the United States over 100 children die,[1] and another 27,000 are injured[2] from accidents on farms. Agriculture consistently ranks as one of most dangerous and deadly industries in the United States, having an accidental work related death rate of 24 per 100,000 workers compared with 4 per 100,000 for all other industries combined.[3] Wisconsinites have long been proud of their state as a primary producer of dairy, grain, vegetables and cranberries. In addition, the family farm, where parents and children both live and work on the premises, has been a long-standing tradition in Wisconsin. Children in Wisconsin not only live and play on the family farm, but are expected to participate in farm chores at an early age. Thus Wisconsin children are at a particular risk for incurring injuries and even dying from accidents on the farm. The purpose of this review is to provide an understanding of the local and national epidemiology of agricultural injury in children, to review the type of injuries and factors associated with injury, and to discuss the physician's role in preventing such morbidity and mortality.

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EPIDEMIOLOGY

Various studies in Wisconsin, other states and countries have described the epidemiologic variables associated with childhood farm injuries. The exact incidence of such injuries has been difficult to determine, as not all injuries are brought to medical attention, and some of those that are may not be picked up by surveillance systems. Exact figures are more important to public health officials than to clinicians. However, the disturbing common nature of childhood farm injury is illustrated by these incidence estimates. Various reviews use differing age ranges to define childhood injury. In general, this review will define children as individuals less than 20 years of age unless otherwise noted. Table 1 shows various estimates of the death and injury rate among farm children. It is estimated that farm-related accidents are responsible for at least 27,000 injuries [2] and 103 deaths [1] in children per year in the United States. In Wisconsin, 39 children and youths age 0-19 years died from farm injuries over the period 1995-1999. Of these, 27 were age 14 or younger.[4] Farm machinery deaths in Wisconsin were only exceeded by deaths from motor vehicles, fires and drownings.[5]

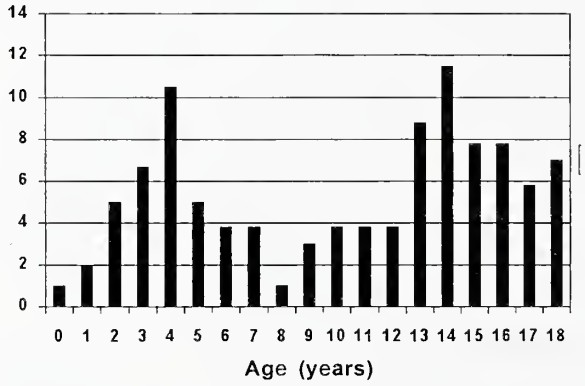
In most epidemiologic studies, several patterns with regard to childhood agricultural injury emerge. When the age which injury occurs is evaluated, a bimodal distribution is seen with a peak at 3-4 years of age and second peak at 13-16 years[6,7,8] (Figure 1). This first peak represents a time when children have developed

Table 1. Annual Rates of Childhood Agricultural Injury and Death in Various Epidemiologic Studies

Study Population	Rate*	
	Deaths	Injuries
US rural children age 0-19 yrs.[12]	13.2	1,551
WI rural children ages 0-9 yrs. [10]	3.2	
Illinois rural children ages 0-9 yrs. [10]	1.5	
Total WI population[5]	0.6-0.9	
US rural children ages 0-19 yrs. [1]	8.0	
Ontario children ages 0-19 yrs. [18]		70
WI rural children ages 0-17 yrs. [20]		1800

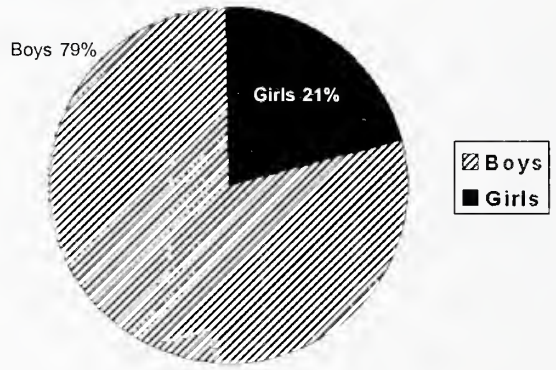
*per 100,000 persons in study population

Figure 1. Percent of Childhood Farm Injuries by Age



Derived from reference 9

Figure 2. Gender Differences in Childhood Rural Injuries



Derived from references 1, 6, 7, 8, 12, 18, 20, 27

an increased mobility and curiosity, yet lack the judgment needed to avoid injury. The second peak in the teenage years may be explained by increased time actually spent working, increased risk taking behavior, and performing tasks with machinery that exceed the child's motor skills.[9]

A clear gender pattern has been demonstrated in multiple studies with a strong predilection for boys. Figure 2 shows this uneven distribution. This has been attributed to increased outdoor activity by boys, cultural expectations and customs, and increased risk taking behavior by males.

There is also a distinct correlation between season of the year and youth injuries on farms. Predictably, injuries peak in the mid-summer through late fall, corresponding to planting and harvesting times.[10,11] During these months, young children are likely to be outdoors when equipment is operating. In addition, since school is not in session in the summer, children are available more hours per week on the farm.

MACHINERY AND OTHER AGENTS OF INJURY

Non-farm children live and play in an environment relatively free from overt hazards other than motor vehicles and household poisons. Farm children, on the other hand, have much greater exposure to multiple hazards. The greatest hazards are the machinery used around the farm. However, other hazards such as animals, chemical agents and farm structures present risk of injury to farm children. The agents ascribed to agricultural injury in children have been described in several studies and are presented in Table 2, along with the relative frequency that they are associated with injury. By far and away, the tractor is the most common agent of such injuries. In addition, tractors are the most common agents involved in fatal farm injuries.[12] Tractor related injuries typically involve one of several scenarios. The most common of these is when a child is allowed to ride on a moving tractor, falls from the tractor and is crushed by the moving wheels or by the implements in tow.[9,11] Another common runover scenario is when the child is an unseen bystander in the barnyard. The power take-off device or PTO is frequently involved in tractor accidents. The PTO is a rotating shaft that extends from the rear of the tractor in order to transmit power at high rotational speeds to implements. Entanglements in the PTO shaft represent about 6% of all childhood farm injury[13] and up to 40% of all tractor-associated injuries.[8] In addition, PTO injuries result in more severe injuries with a high rate of disability.[8] The third tractor injury scenario is tractor roll-over. Tractors by design have a relatively high center of gravity and the tractor may tip over crushing its occupant. Roll-over protection structures, present on many new tractors, are frequently not present on older model tractors.

Other equipment involved in injury includes wagons, where children may sustain fall injuries or be crushed by tires, or any of a number of other farm machines in which a child may become entangled. In addition, augers deserve mention because of their high rate of causing severe injuries, in particular amputation and strangulation.[8]

Non-machine injuries such as animal-associated

injuries represent a significant percentage of childhood farm injury. Of these, the majority are associated with horses.[1] Most of these involve falls when horseback riding or from being kicked by the horse.[9] In addition, contact with cows causes a significant number injuries in children.[9] Frequent non-mechanical agents of injury include such things as pesticides[2,14] and caustic alkaline cleaning agents.[15] Also, children may fall from silos, barns or other structures sustaining significant injuries. Lastly, drownings on the farm represent up to 19% of fatal accidents involving rural children.[10]

TYPES OF INJURIES

Lacerations and puncture wounds represent the most common type of injury seen in children sustaining accidents on the farm.[1] These lacerations may be relatively superficial requiring simple sutures or deep, extensive, and even fatal injuries.[16] Contusions and abrasions are the next most frequent type of injury, followed by fractures/dislocations, strains/sprains and burns. Amputations represent 3% of all childhood injuries.[1] A significant, late complication of injuries from machines is infection. In one series, 72% of children whose wounds involved deep lacerations or who had exposed bone developed clinical and microbiologic evidence of infection. Enterococci, gram negative enteric organisms (including pseudomonas) and anaerobes were frequently isolated.[17] This likely reflects contamination of machine surfaces with soil and animal feces and clearly contributes to the long-term morbidity following injury.

The most common sites of injuries are the upper and lower extremities, followed by the face and head, and then the trunk. Of note, in children less than 5 years of age, 47% of all injuries occurred in the head and face, compared with 12% in teens. Preschool children have a particularly high rate of fall type injuries, which explains part of this difference.

FACTORS CONTRIBUTING TO THE INJURY OF CHILDREN

Injury researchers have identified a number of factors contributing to the accidental death and injury of rural children. Lack of parental supervision was found in 36% of such injuries in one study.[8] Preschool-age children may be cared for on the farm rather than a separate daycare setting,[1] which may result in the proximity of children to working equipment. Parents may be distracted by their work and not notice children approaching machinery. Operator fatigue, particularly during the long days of harvest season, may contribute to diminished attention.[2] Child workers themselves may be expected to work long hours and tire more easily than adults.[2] In addition, children may be given tasks inappropriate for age, "requiring greater physical, mental, or emotional maturing than present" for the age of the child.[6,18] Financial stresses, particularly on small family farms, may increase the dependence on children to help work the farm. Such financial factors may also result in the presence of older poorly maintained equipment that may increase the risk of injury.[10] The purposeful disabling of safety devices also contributes to such risks.[20] As mentioned previously, tractors are involved in the majority of serious farm injuries. Permitting children to ride on tractors increases the chance of falls, crush or roll-over injuries.[8] Finally, geographic factors such as long distance to a local hospital or access to pre-hospital emergency care may be associated with increased mortality after injury.[19]

Table 2. Relative frequency of agents involved in farm injuries in children

Agent	Relative Frequency
Machinery	++++
Tractors	++++
Tillage Equipment	++
Combine	+
Balers	+
Wagons	+++
Elevators/conveyors/augers	++
ATV/motorbikes	++
Forklifts	+
Animals	+++
Cows	++
Horses	+++
Structures (barns, buildings, silos)	++
Chemicals (pesticides and cleaners)	+
Water (Drownings)	++

++++ Very frequent
+++ Frequent
++ Occasional
+ Infrequent but reported
Derived from sources 1,8,9,11,12,14,15

Table 3. Counseling Families on Farm Safety

Do not allow children to ride on or play around tractors.
Continually supervise children when they are in or near work areas and equipment.
Place fences around pools, ponds and other bodies of water
Separate work and living/play areas with fences or other barriers.
Children who work the farm should be appropriately trained. Children should not be given tasks that they are developmentally not able to handle.
Horseback riders should always wear protective headgear.
Do not remove safety devices and replace those that are missing. Older tractors should be retrofitted with rollover protection devices and PTO guards.

PREVENTION

Accidental injury to children on the farm should always

be considered preventable and not simply considered an inherent risk or a cost of doing business. Three major areas of prevention have been discussed – education, safety devices and legislation/regulation.

The health care provider can have the greatest impact by educating adults and children who live and work on farms. Table 3 lists several important points providers may discuss with patients. First and foremost, parents must be instructed to continually supervise children while they are playing or working on the farm. Extra vigilance is needed for toddlers and preschoolers, particularly when they are in or near barns, fields or other work areas. Having access to affordable child-care assists in such supervision. In addition, children should not be allowed to climb on silos or buildings as they risk fall injuries. Families should be encouraged to erect fences or other barriers between living/play and working areas.[10] Children should be taught respect for cows and horses, and young children should learn to maintain a safe distance between themselves and animals. Children who ride on horseback should wear protective headgear at all times.[9] When children work on farms they must participate only in tasks that they are able to handle from a motor skills, emotional and cognitive development standpoint.[20] Parents should exercise care not to fatigue child workers with long hours.

Farm equipment manufacturers have developed safety devices that provide continuous passive protection from hazardous machinery. For example, rollover protection devices are now commonplace on new tractors. Such devices are required by the US Occupational Safety and Health Administration (OSHA) only for post-1976 tractors operated by employees, thus exempting most family farms.[8] Many older tractors lack such protection devices. Shields around PTO shafts are another safety device designed to reduce a common cause of serious injury. Such devices are only required on farms that employ more than 10 non-family workers.[8] More effective safety engineering of farm equipment is present on much newer equipment. However, most safety equipment is not required by law for family farms, the place where children are most likely to be injured. In addition, safety devices that are manufactured on equipment are only effective if they have not been removed. Surveys of such behavior have shown that this practice is far too common and frequently results in serious injury.[8] Difficult economic times for family farms put safety devices low on the farm priority list.

Farmers in America have a tradition of being fiercely independent and self reliant, a quality often necessary to survive the demands that farming places on the individual.[3] Such character is reflected in the fact that agricultural groups have successfully lobbied to exempt most family farms from OSHA and child labor regulations. Under federal labor laws children older than 12 years of age may be employed on any farm with the consent of the parent. Minors less than 16 are prohibited from engaging in hazardous work on farms. This prohibition does not apply to children working on their family's farm. Thus, children of all ages are exempt from any regulatory requirement and may operate any machine or perform any task their parents deem appropriate.[12] Such exemption from regulation is partly economic in nature and part tradition. Families, unable to hire adult employees, often rely on their children as essential sources of labor. The long tradition of having children work the farm is exemplified in summer vacation from school. This practice originated in our culture so that children could help with planting and harvest. The relative lax regulation of child farm labor stands in sharp contrast to other industries where minors younger than 18 years of age are forbidden employment in hazardous occupations.[12] It should be noted that, with nearly 2 million farms in the United States, regulations are difficult to administer and enforce.

RESOURCES

Several valuable resources on farm safety are available to the health care provider and to farm families. Wisconsin is home to the National Children's Center for Rural Agriculture Health and Safety, located at the Marshfield Clinic. The Center has as its goal "to enhance the health and safety of all children exposed to rural agricultural hazards."[21] In addition to performing research, it publishes resource packets on many specific farm hazards as well as the "North American Guidelines for Children's Agricultural Tasks."[22] These guidelines provide parents with a method of assessing whether a child is ready to perform specific tasks on the farm. Jobs such as feeding cows, operating a tractor, using PTO powered implements and many others are listed. Such tasks are broken down into the adult responsibilities, the abilities and training needed for the child and the degree of parental supervision required. Age range recommendations for each specific task are listed, as well as required safety equipment and common hazards found on the farm. This information is provided on the Center's website, which is listed in the references.

The University of Wisconsin Center for Agricultural Safety and Health, part of University of Wisconsin-Extension, collects and publishes yearly data on Wisconsin agricultural fatalities. In addition, the Center provides information for farm rescue training, a farm hazards checklist and informative material on specific hazards such as power take-offs, augers, cattle and other common causes of injury. UW-Extension also has county-based youth tractor and machine operator

certification programs.[23] This information is accessible at the Center's website.[24] Other resources available to health care providers and families include Farm Safety 4 Just Kids[25] and The National Safety Council.[26]

CONCLUSION

Wisconsin has a long, rich history of agriculture and the family farm. Unfortunately, children who live, play and work on the farm may be exposed to serious risk of injury or death. Children are far too frequently expected to perform tasks that they developmentally may not be able to safely execute. All childhood agricultural injuries should be considered preventable. The health-care provider should provide counseling to farm families to prevent such injuries. Given the long-standing resistance of farmers to regulation and practical issues that make enforcement difficult, it is unlikely that legislation will be implemented to improve farm safety. Physicians, nurses and other health care providers should direct patients and their families to resources that provide proper training and education.

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Michael J. Dunn, MD

Dean's Corner

Injury data changes the debate over firearms

Michael J. Dunn, MD, Dean and Executive Vice President
Medical College of Wisconsin

Most diseases in which we intervene as physicians unfold over hours, days or even years. Patients have symptoms and, quite often, we know preventive measures for these ailments. There is a disease, however, that is causing too many preventable deaths in Wisconsin, and it unfolds in a fraction of a second: firearm injury. Since the results are often immediately fatal, we are not able to intervene in the disease's end stage because the patient never reaches us. However, this does not mean physicians are powerless against the problem.

The Firearm Injury Center (FIC) at the Medical College of Wisconsin is dedicated to the reduction of firearm injuries and deaths. Stephen Hargarten, MD, MPH, Chairman and Professor of Emergency Medicine, directs the FIC. Established in 1997 with a grant from the Joyce Foundation and support from the Medical College, the FIC gathers and links data on deaths and injuries involving firearms from hospitals, medical examiners, crime labs and law enforcement agencies across the state.

These data paint a picture that, although alarming, steers the debate over firearms away from politically charged gun control issues toward a public health injury control model focused on gun safety and injury prevention. The current data, which will be enhanced by further studies of gun suicides and parasuicides (unsuccessful attempts), also indicate several roles physicians can play in reducing firearm deaths and injuries in their communities.

Two-thirds of firearm deaths in Wisconsin are suicides. This indicates that any successful effort at suicide prevention should result in a significant decline in firearm deaths and injuries. A physician treating an elderly male for depression, for example, might ask the family if the individual has access to a firearm and suggest that it be removed. Similarly, the family of a young person being treated for depression might be asked to secure any firearms in the house in gun safes or locked cabinets and with trigger locks, or to remove the guns entirely from the home. These measures have nothing to do with restricting gun ownership; they have everything to do with preventing injury by removing risk factors.

Other conclusions from analysis of data gathered through the FIC's Firearm Injury Reporting System have placed the FIC and the Medical College in a national leadership position, particularly in debates over the effectiveness of various gun control measures. Until the FIC started collecting data from sources not previously linked, this knowledge simply did not exist.

For example, the FIC's research in Southeastern Wisconsin has indicated that a gun buy-back program did not bring in the weapons responsible for the majority of firearm injuries. Another analysis indicated that the Assault Weapons Ban of 1994 has had a negligible effect on the types of firearms linked with mortality in one large Midwestern urban community.

Historically, attempts to address the disease of firearm injury through legislation and enforcement have proven limited. They have not addressed the right symptoms, have not adequately identified the agent and vehicle (i.e. specific bullets and guns) of the disease and have done little to improve the high-risk environment associated with firearm-related injuries. Another approach is needed, modeled on the national system of monitoring motor vehicle safety that has evolved in this country over the last 25 years.

Data from motor vehicle crashes have focused attention on the effects of seat belts, air bags, vehicle design, highway

design, drunken driving and, most recently, tires on automotive safety. Similarly, increased support for firearm injury research will enable us to identify the factors in the social environment and in the design of the guns themselves that contribute to firearm injuries. This is much-needed research. If current trends continue, firearm fatalities will exceed the number of people killed in car crashes.

Based on the experience of FIC staff, policy makers are eager to look at scientific data presented by the medical community. Physicians are considered leaders who can present scientific arguments based on sound analysis, without bias other than a desire to improve the health in our communities.

The FIC is working to educate physicians in addressing firearm injuries as a public health issue. Doctor Hargarten and his colleagues have published several resources for physicians and health care professionals, including *Reducing Firearm Injury and Death: A Public Health Sourcebook on Guns* (1997, Rutgers University Press). More information is also available at the FIC's Web site, www.mcw.edu/fic.

Through leadership, advocacy and intervention, we can stop the spread of this disease. I am pleased that the state of Wisconsin and the Medical College of Wisconsin are providing a national model for firearm injury research and prevention.

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New guidelines published for managing community-acquired pneumonia

Jay A. Gold, MD, JD, MPH; and Dennis Spurlin

In early November, MetaStar sent an article published by the Infectious Diseases Society of America to quality improvement directors and coordinators in all Wisconsin acute care hospitals. The article, "Practice Guidelines for the Management of Community Acquired Pneumonia in Adults,"[1] was based on guidelines revised in April and published in September.

Since these guidelines constitute the most up-to-date recommendations for managing community-acquired pneumonia, it is important that physicians consider them when caring for pneumonia patients. Five recommendations in particular deserve careful examination based on improvement opportunities noted in a recent paper in the *Journal of the American Medical Association (JAMA),*[2] which examined hospitals' performance in caring for Medicare patients:

- **Antibiotic within 8 hours of arrival at hospital.** The guidelines indicate (p. 370): "For patients requiring hospitalization for acute pneumonia, it is important to initiate therapy in a timely fashion; an analysis of 14,000 patients showed that a >8-h delay from the time of admission to initiation of antibiotic therapy was associated with an increase in mortality [citation omitted]. Antibiotic treatment should not be withheld from acutely ill patients because of delays in obtaining appropriate specimens or the results of Gram stains and cultures."
- **Antibiotic consistent with current recommendations.** The guidelines list the preferred antimicrobial agents for community acquired pneumonia (p. 372 and Tables 14,15): "The antimicrobial agents preferred for most patients are as follows (in no specific order): in general medical wards, cefotaxime or ceftriaxone plus a macrolide (azithromycin, clarithromycin or erythromycin) or a fluoroquinolone alone (levofloxacin, gatifloxacin, moxifloxacin, trovafloxacin or another fluorquinolone with enhanced activity against *S. pneumoniae;* fluoroquinolones with in vitro activity against most clinically significant anaerobic pulmonary pathogens include trovafloxacin, moxifloxacin and gatifloxacin); and in ICU's, a b-lactam (cefotaxime, ceftriazone, ampicillin-sulbactam or piperacillin-tazobactam) plus either a macrolide or a fluoroquinolone."
- **Blood culture drawn (if done) before antibiotic given.** The guidelines note (pp. 369-371): "Patients who are candidates for hospitalization with acute pneumonia should have blood cultures performed and an expectorated sputum specimen collected (in the presence of the physician whenever possible) before antimicrobial administration, unless these procedures would substantially delay initiation of treatment."
- **Patient screened for or given influenza vaccine; and**
- **Patient screened for or given pneumococcal vaccine.** The guidelines (pp. 376-377) note that influenza vaccine "is recommended to be given annually to persons at increased risk for complications;" and patients who have not received the pneumococcal vaccine "with risk factors for pneumococcal disease and influenza should...be vaccinated during hospitalization whenever possible." The guidelines also note "there is no contraindication for use of either pneumococcal or influenza vaccine immediately after an episode of pneumonia (i.e., before hospital discharge). The vaccines are inexpensive and can be given simultaneously." The *JAMA* article reports that few hospitals are following these recommendations: only 23% of Medicare patients with pneumonia in Wisconsin hospitals are being assessed for or given influenza vaccine, and only 17% for pneumococcal vaccine.

For further information regarding the updated guidelines for community-acquired pneumonia, please contact your hospital's quality improvement director.

Authors are with MetaStar, Inc. Doctor Gold is Senior Vice President and Principal Clinical Coordinator; Mr. Spurlin is a Communications Specialist.

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